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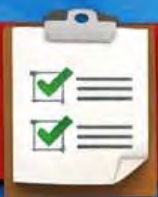


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CBSE EXAM PAPER 2026

CLASS XII

Physical Education

Time : 3 Hours

Max. Marks : 80

General Instructions:

- (i) The question paper consists of 5 sections and 37 questions.
 - (ii) Section-A consists of question 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.
 - (iii) Section-B consists of questions 19-24 carrying 2 marks each and are Very Short Answer type and their answer should not exceed 60-90 words attempt any 5.
 - (iv) Section-C consists of questions 25-30 carrying 3 marks each and are Short Answer type and their answer should not exceed 100-150 words. Attempt any 5.
 - (v) Section-D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.
 - (vi) Section-E consists of questions 34-37 carrying 5 marks each and are Long Answer type and their answer should not exceed 200-300 words. Attempt any 3.
-

SECTION-A

(All Questions are Compulsory)

1. Which of the following is the next step after planning the sports event?

- (A) Staffing
- (B) Directing
- (C) Controlling
- (D) Organising

Ans :

- (D) Organising

In sports event management, planning is the first function of management. The next step is organising, which involves arranging resources, assigning responsibilities and forming committees for smooth execution. Without organising, planning cannot be implemented effectively. Therefore, organising logically follows planning in the management process.

2. _____ is an event to showcase children and youth's abilities and prowess on the sports field.

- (A) Run for Fun
- (B) Run for a specific cause
- (C) Sports Day
- (D) Health Run

Ans :

- (C) Sports Day

Sports Day is a school-level event organised to provide students opportunities to display their

physical abilities, sports skills and competitive spirit. It includes various athletic and team events. The main objective is participation, performance and talent identification, making it suitable for showcasing children's abilities and prowess.

3. Corrective exercises should be done under a _____ advice and supervision.

- (A) Physician's or Physical Education teacher's
- (B) Physical Education teachers' or Physiotherapists'
- (C) Physical Education Teacher's or Coaches
- (D) Physician's or Physiotherapist's

Ans :

- (D) Physician's or Physiotherapist's

Corrective exercises are designed to correct postural deformities or physical defects. These exercises require medical assessment and professional supervision to avoid further complications. Physicians diagnose the condition and physiotherapists guide therapeutic exercises safely. Therefore, corrective exercises must be performed under physician's or physiotherapist's advice and supervision.

4. Which of the following asanas are practised to correct "Kyphosis"?

- (A) Chakrasana, Trikonasana, Adhomukhasana
- (B) Dhanurasana, Bhujangasana, Halasana
- (C) Bhujangasana, Trikonasana, Chakrasana
- (D) Dhanurasana, Chakrasana, Bhujangasana

Ans :

(D) Dhanurasana, Chakrasana, Bhujangasana
Kyphosis is an excessive outward curvature of the upper spine. Backward bending asanas help strengthen back muscles and improve posture. Dhanurasana, Chakrasana and Bhujangasana stretch chest muscles and strengthen spinal extensors, reducing spinal curvature. These asanas are recommended corrective measures for kyphosis in physical education syllabus.

5. Gagan wants to prevent himself from asthma and hypertension. Identify the asanas to prevent him from these lifestyle diseases.

- (A) Uttan Mandukasana, Vakrasana
- (B) Supta Vajrasana, Vakrasana
- (C) Chakrasana, Uttan Mandukasana
- (D) Vakrasana, Chakrasana

Ans :

(A) Uttan Mandukasana, Vakrasana
Asthma and hypertension are lifestyle diseases linked to stress and poor breathing efficiency. Uttan Mandukasana improves lung capacity and respiratory function, helpful in asthma. Vakrasana enhances blood circulation and regulates blood pressure, beneficial for hypertension.

6. Identify the asana:



- (A) Ardh Matsyendrasana
- (B) Dhanurasana
- (C) Uttan Mandukasana
- (D) Yogmudra

Ans :

(C) Uttan Mandukasana
In the given figure, the person is sitting in Vajrasana position with arms raised upward and elbows bent, indicating chest expansion posture. This posture represents Uttan Mandukasana.

It improves lung function, strengthens shoulder muscles and helps manage respiratory disorders, making it identifiable from the illustrated position.

7. Which of the following competition was organised by Guttman at the 1948 London Olympics for disabled persons?

- (A) Running competition
- (B) Swimming competition
- (C) Wheelchair competition
- (D) Bicycle competition

Ans :

- (C) Wheelchair competition

Dr. Ludwig Guttmann organised the Stoke Mandeville Games in 1948 alongside the London Olympics for World War II veterans with spinal injuries. The competition mainly included wheelchair sports. This event later became the foundation of the Paralympic Games. Hence, wheelchair competition is correct.

8. The Oath: "Let me win. But if I cannot win, let me be brave in the attempt" is related to which of the following games?

- (A) Special Olympics
- (B) Paralympics
- (C) Deaflympics
- (D) Summer Olympics

Ans :

- (A) Special Olympics

The oath "Let me win. But if I cannot win, let me be brave in the attempt" is the official oath of the Special Olympics. It emphasizes courage, participation and effort rather than victory. The Special Olympics are organised for persons with intellectual disabilities, promoting inclusivity and sportsmanship.

9. Match the items of List-I with List-II and choose the correct option:

List-I (Food Group)		List-II (Functions)	
(a)	Protein	(i)	These are the main sources of energy
(b)	Carbohydrates	(ii)	It is a negligible source of energy
(c)	Fats	(iii)	Repair body cells
(d)	Roughage	(iv)	It helps in transporting fat-soluble vitamins

Match the items of List-I with List-II and choose the correct option from the following:

	(a)	(b)	(c)	(d)
(A)	(i)	(ii)	(iii)	(iv)
(B)	(iv)	(iii)	(i)	(ii)
(C)	(iii)	(iv)	(i)	(ii)
(D)	(iii)	(i)	(iv)	(ii)

Ans :

(A) (iii) (i) (iv) (ii)

Proteins repair and build body tissues, so (a) matches (iii). Carbohydrates are the primary energy source, so (b) matches (i). Fats help transport fat-soluble vitamins like A, D, E and K, so (c) matches (iv). Roughage provides negligible energy, matching (d) with (ii).

10. Which of the following statement is correct regarding the Basal Metabolic Rate (BMR)?

- (A) It is the number of calories needed to maintain energy level during exercise.
 (B) It is the number of calories needed to maintain the body at movement.
 (C) It is the number of calories needed to maintain body function at high speed.
 (D) It is the number of calories needed to maintain body function at rest.

Ans :

(D) It is the number of calories needed to maintain body function at rest.

Basal Metabolic Rate (BMR) refers to the minimum amount of energy required by the body to maintain vital functions such as breathing, circulation and temperature regulation while at complete rest. It does not include physical activity. Therefore, maintaining body functions at rest defines BMR correctly.

11. Which of the following is the long-term effect of exercise on the respiratory system?

- (A) Residual volume increases
 (B) Respiratory rate increases
 (C) Stroke volume increases
 (D) The rate of exchange of gas increases

Ans :

(D) The rate of exchange of gas increases

Regular exercise strengthens respiratory muscles and improves lung efficiency. It enhances alveolar capacity and increases the rate of gaseous exchange between lungs and blood. Resting respiratory rate generally decreases in trained individuals. Therefore, increased rate of exchange of gases is a correct long-term adaptation.

12. Assertion (A): When an object or body is moving at a constant velocity, with no changes in speed or direction, it is in dynamic equilibrium.

Reason (R): A cyclist in motion or the body position maintained by a sprinter on the track while running are examples of dynamic equilibrium.

In the context of the above two statements, which one of the following is correct ?

- (A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.

Ans :

(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).

Dynamic equilibrium occurs when a body moves with constant velocity while balanced by equal opposing forces. The assertion correctly defines dynamic equilibrium. The reason gives appropriate examples, such as a cyclist moving steadily or a sprinter maintaining body balance while running. Hence, both statements are true and related.

13. Match the items of List-I with List-II and choose the correct option:

List-I (Example of friction)		List-II (Types of friction)	
(a)	Pushing a chair	(i)	Sliding friction
(b)	Sea waves	(ii)	Rolling friction
(c)	Moving heavy (stationary) objects	(iii)	Fluid friction
(d)	Skating	(iv)	Static friction

Which of the following options correctly matches the items of list (I) with those in list (II)?

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	(a)	(b)	(c)	(d)
(A)	(i)	(iii)	(ii)	(iv)
(B)	(iv)	(ii)	(i)	(iii)
(C)	(i)	(iii)	(iv)	(ii)
(D)	(ii)	(i)	(iv)	(iii)

Ans :

(C) (i) (iii) (iv) (ii)

Pushing a chair involves sliding friction, so (a) matches (i). Sea waves experience fluid friction, matching (b) with (iii). Moving heavy stationary objects involves overcoming static friction, so (c) matches (iv). Skating involves rolling friction between wheels and surface, matching (d) with (ii).

- 14.** Which of the following statements is correct regarding the lever's fulcrum?

- (A) It is a point at which the force is applied.
- (B) It is a point at which the load is located.
- (C) It is a point at which the lever rotates.
- (D) It is a point at which efforts are made.

Ans :

(C) It is a point at which the lever rotates.

A fulcrum is the fixed pivot point around which a lever rotates. In lever systems, effort is applied at one point and load is moved at another, but rotation occurs about the fulcrum. Therefore, the fulcrum serves as the turning axis of the lever in biomechanics.

- 15.** Assertion (A): Actions and responses of two athletes may differ during a match situation.

Reason (R): Personality is the combination of an individual's thoughts, characteristics, behaviour, attitude and habits.

In the context of the above two statements, which one of the following is correct?

- (A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

Ans :

(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).

Athletes respond differently in match situations due to variations in personality traits. Personality includes thoughts, behaviour, attitudes and habits, which influence decision-making and reactions under pressure. Therefore, both statements are true, and personality differences explain why athletes' actions and responses may vary during competition.

- 16.** Shweta is over-stressed and anxious as she is preparing for her 'NEET' exam. Which of the following is a suitable reason for her to exercise?

- (A) To develop physical strength
- (B) Mental Relaxation
- (C) For Socialisation
- (D) To Reduce the risk of disease

Ans :

(B) Mental Relaxation

Exercise helps reduce stress and anxiety by releasing endorphins, improving mood and promoting relaxation. For students preparing for competitive exams like NEET, physical activity improves mental well-being and concentration. Therefore, mental relaxation is the most suitable reason for Shweta to engage in regular exercise.

- 17.** Which one of the following is NOT correct regarding the training cycle in sports?

- (A) A mesocycle is termed as medium duration training.
- (B) The duration of a microcycle is 3 to 10 days.
- (C) The duration of the mesocycle is 3 to 6 weeks.
- (D) The macrocycle has the minimum duration of training.

Ans :

(D) The macrocycle has the minimum duration of training.

A macrocycle is the longest training cycle, usually lasting several months to one year. A mesocycle is medium duration, generally three to six weeks, and a microcycle lasts about three to ten days. Therefore, stating that macrocycle has minimum duration is incorrect.

18. Which of the following types of endurance is classified according to the nature of the activity?
- Speed endurance
 - Medium time endurance
 - Specific endurance
 - Short-term endurance

Ans :

(C) Specific endurance

Endurance classified according to the nature of activity is called specific endurance. It refers to the ability to perform efficiently in a particular sport or activity. Other types like short-term and medium-time endurance are classified based on duration. Hence, specific endurance is correct.

SECTION – B

(Attempt any 5 questions)

19. “Sports that require athletes to maintain a specific weight to perform well are at higher risk of developing eating disorders.” Justify this statement.

Ans :

Sports such as wrestling, boxing and gymnastics require athletes to maintain specific weight categories.

Justification:

- Pressure to maintain weight leads to extreme dieting.
- Fear of disqualification increases unhealthy eating habits.
- Athletes may adopt starvation or purging methods.
- This increases the risk of eating disorders like anorexia and bulimia.

20. Write any four benefits of Nadi-Shodhan pranayama.

Ans :

- Improves lung capacity.
- Reduces stress and anxiety.
- Enhances concentration.
- Balances the nervous system.

21. What is the role of Physical Education teachers in promoting inclusion in sports?

Ans :

- Encourage participation of children with disabilities in regular sports activities.
- Modify rules and equipment according to individual needs.
- Promote equal opportunities and avoid discrimination.
- Create awareness among students about inclusivity and respect.

22. Explain the procedure of any one strength test of the SAI Khelo India Fitness Test used for 9 to 18 years/class 4 to 12 children.

Ans :

50 Meter Standing Start Run (Strength/Speed Test)

Procedure:

- The student stands behind the starting line.
- On the signal “Go”, the student runs 50 meters as fast as possible.
- Time is recorded with a stopwatch.
- The best time is considered for assessment.

23. In the examples given below, which of the Newton’s Law of Motion will apply? Justify your answer.

- When a swimmer pushes the water backwards.
- When a cricket and tennis ball are thrown with the same force, the tennis ball moves with greater acceleration.

Ans :

- (a) Law Applied: Newton’s Third Law of Motion

Justification:

For every action, there is an equal and opposite reaction. When the swimmer pushes water backward (action), water pushes the swimmer forward (reaction).

- (b) Law Applied: Newton’s Second Law of Motion

Justification:

According to $F = ma$, acceleration is inversely proportional to mass. The tennis ball has less mass, so it gains greater acceleration with the same force.

- 24.** Briefly explain talent selection and talent transfer in the process of talent identification.

Ans :

In the process of talent identification in sports, talent selection and talent transfer are two important stages:

1. Talent Selection: It is the process of choosing suitable athletes for a particular sport based on physical and performance characteristics.
2. Talent Transfer: It is shifting an athlete from one sport to another where their abilities are better suited for higher performance.

SECTION – C

(Attempt any 5 questions)

- 25.** Compare and contrast the intramural and the extramural tournament.

Ans :

The comparison between intramural and extramural tournaments is shown in the table below:

Basis	Intramural Tournament	Extramural Tournament
Meaning	Tournament conducted within the same institution among its students.	Tournament conducted between teams of different schools, colleges or institutions.
Objective	To promote mass participation, recreation and internal talent development.	To provide higher level competition and exposure.
Level of Competition	Low to moderate level.	High competitive level.
Participation	Maximum number of students participate.	Selected and trained players participate.
Examples	House matches, inter-class competitions.	Inter-school, inter-district tournaments.

- 26.** Devise a plan of physical activities in accordance with World Health Organization guidelines for adults aged 65 and above.

Ans :

According to WHO guidelines:

1. Aerobic Activity: At least 150–300 minutes of moderate-intensity activity per week (e.g., brisk walking).
2. Muscle Strengthening: At least 2 days per week involving major muscle groups.
3. Balance Training: Activities like Tai Chi or simple balance exercises three times per week.
4. Flexibility Exercises: Stretching exercises regularly to maintain joint mobility.

- 27.** Enlist the asanas for obesity. Explain the procedure of any one asana for it.

Ans :

Asanas for Obesity:

1. Tadasana
2. Bhujangasana
3. Dhanurasana
4. Pawanmuktasana

Procedure of Bhujangasana:

1. Lie flat on the stomach, legs together and palms under shoulders.
2. Inhale and slowly raise the chest upward.
3. Keep elbows slightly bent and look upward.
4. Hold the position for 10–15 seconds and return slowly.

- 28.** Prashant began vomiting after lunch at school. He was promptly taken to a nearby doctor, who diagnosed him with food intolerance. Outline three types of food intolerance.

Ans :

1. Lactose Intolerance: Inability to digest lactose found in milk.
2. Gluten Intolerance: Difficulty in digesting gluten present in wheat and barley.
3. Food Additive Intolerance: Reaction to artificial colors, preservatives or flavor enhancers.

- 29.** Elucidate three physiological changes that occur due to ageing.

Ans :

1. Decrease in muscle mass and strength.
2. Reduced lung capacity and cardiovascular efficiency.
3. Decline in bone density leading to osteoporosis.

30. Describe three factors that affect the trajectory of a projectile.

Ans :

The three main factors that affect the trajectory of a projectile are explained below:

1. Angle of Projection: Determines the height and range of the projectile.
2. Velocity of Projection: Greater velocity increases distance covered.
3. Height of Release: Higher release point increases flight time and range.

SECTION – D

(Internal choices available)

31. Anita prepared a fixture based on the league competition. She distributed this fixture to the coaches of all the teams. When Khushi received this fixture, it was misprinted and showed only the matches of rounds three and four. According to the above statement, study the fixture given below.

III		IV	
Round		Round	
5	Bye	4	Bye
4	6	3	5
3	7	2	6
2	1	1	7

Based on the above fixture and your previous knowledge answer the following questions :

- In which round the match between number 4 and 3 teams will be held?
- How many rounds will be played in the tournament?
(A) 6 (B) 7
(C) 5 (D) 4
- In which round team number 2 will get a bye?
- How many matches will be played in the above fixture?
(A) 21 (C) 19
(B) 23 (D) 18

or

The other name for a league tournament is

Ans :

- In a league (round robin) tournament with 7 teams, each team plays every other team once. According to standard cyclic method

fixture, match between team 4 and team 3 is played in Round IV (4th Round).

- (ii) (B) 7

Number of teams = 7

Formula (League Tournament):

If number of teams is odd — Rounds = N

Rounds = 7

- (iii) In odd number league tournaments, one team gets a bye in each round. According to standard fixture rotation method, Team 2 gets a bye in Round VI (6th Round).
- (iv) Formula for total matches in league tournament:

$$\begin{aligned}
 \text{Total Matches} &= \frac{N(N-1)}{2} \\
 &= \frac{7(7-1)}{2} \\
 &= \frac{7 \times 6}{2} \\
 &= \frac{42}{2} = 21
 \end{aligned}$$

or

Round Robin Tournament

32. Rohan, a 16 year old student, got injured after colliding with Sachin during a football match. He was having unbearable pain in his ankle, and it was swollen. The coach noticed a collection of blood outside the blood vessels on Sachin's forehead too. He immediately gave first aid to both and rushed them to the hospital.

Answer the following questions based on the above case and your prior knowledge:

- What type of injury did Rohan suffer?
(A) Strain (B) Abrasion
(C) Sprain (D) Laceration
- Sachin had _____ on his forehead.
(A) Contusion (B) Fracture
(C) Laceration (D) Incision
- If Sachin suffered abrasion during the injury, which of the following symptoms would he have?
(A) Tear of Ligament
(B) Rubbing away of upper layer of epidermis
(C) Tear of muscles
(D) Instability of joints
- A fracture in a soft bone, in which the bone bends, is known as _____.
(A) Comminuted fracture
(B) Transverse fracture
(C) Greenstick fracture
(D) Oblique fracture

Ans :

- (i) (C) Sprain

Rohan had severe ankle pain and swelling after collision. A sprain occurs when ligaments around a joint are overstretched or torn due to sudden twisting or impact. Swelling and pain are common symptoms. Hence, his injury is identified as a sprain.

- (ii) (A) Contusion

The case mentions collection of blood outside blood vessels on Sachin's forehead. This condition is called contusion or bruise. It results from blunt force injury causing capillary damage beneath the skin without breaking it. Therefore, the correct answer is contusion.

- (iii) (B) Rubbing away of upper layer of epidermis

An abrasion is a minor injury caused by friction against a rough surface. It results in removal of the upper layer of skin called epidermis. It does not involve ligament or muscle tear. Hence, rubbing away of the upper epidermal layer is correct.

- (iv) (C) Greenstick fracture

A greenstick fracture commonly occurs in children because their bones are soft and flexible. In this type of fracture, the bone bends and partially cracks instead of breaking completely. It resembles a broken green twig. Therefore, it is known as greenstick fracture.

- 33.** 17-year-old Akriti is a student in class 12. She is deaf and mute by birth. She communicates through lip movements and gestures, and understands others through the same. She has only one friend in the class, Raghav. The other students in the class hesitate to talk and play with her. Whenever there is a team activity in the class, no one except Raghav is willing to include her in his team. As a result, Akriti feels isolated and alone in the class. Raghav approached their physical education teacher, Sarita, about this issue. Sarita gave him some suggestions on how Akriti can be included in the class through physical activities and how she can be made to feel more integrated.

Answer the following questions based on the above case and your prior knowledge:

- (i) What type of challenges Akriti is facing?

- (A) Visually impaired
- (B) Hearing and speech impaired
- (C) Physical disability
- (D) Learning disability

- (ii) Why does Akriti feel isolated in her physical activity class?

- (A) Because she is not interested in studies.
- (B) Because her teacher is not supportive
- (C) Because other students hesitate to interact with her.
- (D) Due to lack of physical fitness.

- (iii) Which of the following is the key principle of inclusive physical education?

- (A) Segregation
- (B) Integration
- (C) Exclusion
- (D) Adaptation

or

What strategy can be used to facilitate communication with Akriti during physical activities?

- (A) Using loud verbal instructions
- (B) Using sign language or gestures
- (C) Ignoring her needs
- (D) Focusing only on written communication

- (iv) How physical activities can be made inclusive to meet Akriti's needs?

- (A) By providing training in comfortable and emotionally secure environment.
- (B) By excluding her from activities
- (C) By providing separate programs
- (D) By focusing only on individual activities

Ans :

- (i) (B) Hearing and speech impaired

Akriti is deaf and mute by birth, meaning she has difficulty in hearing and speaking. This condition is classified as hearing and speech impairment. It affects communication but not physical movement or learning ability. Therefore, the correct category of challenge she faces is hearing and speech impairment.

- (ii) (C) Because other students hesitate to interact with her.

The case clearly states that other students hesitate to talk and play with Akriti and do not include her in team activities. This lack of social interaction causes her to feel isolated. Therefore, her isolation is due to hesitation and exclusion by classmates.

- (iii) (B) Integration

Inclusive physical education focuses on integrating students with disabilities into regular classes rather than separating them. Integration promotes equal participation, social acceptance and cooperation among students. It ensures that children with special

needs learn and play together with others. Hence, integration is the key principle.

or

(B) Using sign language or gestures

Since Akriti communicates through lip movements and gestures, the most effective strategy is using sign language or visual gestures. Loud verbal instructions will not help due to her hearing impairment. Therefore, adapting communication through gestures ensures better understanding and participation.

(iv) (A) By providing training in comfortable and emotionally secure environment.

Inclusive physical education requires creating a safe, supportive and emotionally secure environment. Students with disabilities should participate with peers rather than being excluded or separated. Providing encouragement, suitable modifications and positive classroom climate helps integration and builds confidence in students like Akriti.

SECTION E

(Attempt any 3 questions.)

34. Differentiate between Scoliosis and Lordosis deformities. Suggest corrective measures for Knock-knee and Flat foot deformities.

Ans :

Difference between Scoliosis and Lordosis are as follows :

Basis	Scoliosis	Lordosis
Meaning	Lateral curvature of the spine (sideways bending).	Excessive inward curvature of the lumbar spine.
Body Shape	“S” or “C” shaped curve when viewed from the back.	Abdomen protrudes forward and hips tilt backward.

35. Raghav plans to conduct strength and flexibility tests specifically for the lower body, targeting his grandfather's friend. Explain in detail the procedure and scoring system to administer these tests.

Ans :

(A) Strength Test – Chair Stand Test (Lower Body Strength)

Procedure:

1. The subject sits on a chair with arms folded across chest.
2. On the signal “Go”, stand up fully and sit down repeatedly for 30 seconds.
3. Arms must remain crossed.
4. Full standing and sitting counts as one repetition.

Scoring: Total number of correct stands completed in 30 seconds is recorded as the score.

(B) Flexibility Test – Chair Sit and Reach Test (Lower Body Flexibility)

Procedure:

1. Sit on the edge of a chair.
2. Extend one leg straight, heel on floor and toe upward.
3. With both hands together, bend forward slowly toward toes.
4. Hold for 2 seconds without jerking.

Scoring: Distance between fingertips and toes is measured in centimeters.

Touching toes = 0 score;

beyond toes = positive score;

short of toes = negative score.

NODIA

36. What do you understand by motivation? Which motivational techniques are used to improve the performance of the players? Explain in detail.

Ans :

Meaning of Motivation:

Motivation is the internal drive or external stimulus that encourages an individual to act towards achieving a goal.

Motivational Techniques:

1. Goal Setting: Setting short-term and long-term achievable goals improves focus and performance.
2. Positive Reinforcement: Rewards and praise increase confidence and effort.
3. Competition: Healthy competition enhances performance levels.
4. Counselling: Psychological support reduces anxiety and builds self-belief.
5. Incentives and Awards: Trophies, certificates and recognition motivate athletes.

- 37.** What is speed? Explain the methods to develop speed in detail.

Ans :

Speed is the ability of an individual to perform a movement or to cover a given distance in the shortest possible time. It is an important component of physical fitness and plays a vital role in sports such as athletics, football, hockey, basketball and cricket. Speed depends upon reaction time, explosive strength, coordination and technique.

Methods to Develop Speed: Speed can be developed through systematic and scientific training methods. The important methods are as follows:

1. **Acceleration Runs :** Athletes gradually increase speed from slow to maximum over a fixed distance. The usual distance ranges between 30 to 60 metres. Proper rest is given between repetitions. Improves starting ability and reaction time.
2. **Pace Runs :** Running at a constant speed over a specific distance helps in maintaining rhythm and proper stride length. It improves coordination and enables the athlete to sustain speed for a longer duration.
3. **Interval Training:** Repeated short distance sprints are performed with proper rest intervals between each repetition. The work and rest ratio is planned carefully. This method enhances speed endurance, anaerobic capacity and explosive power.
4. **Fartlek Training:** It is a combination of slow and fast running performed in natural surroundings. The intensity keeps changing during the activity. This method improves overall speed capacity as well as endurance.

END

CBSE EXAM PAPER 2025

CLASS XII

Physical Education

Time : 3 Hours

Max. Marks : 80

General Instructions:

- (i) The question paper consists of 5 sections and 37 questions.
- (ii) Section-A consists of question 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.
- (iii) Section-B consists of questions 19-24 carrying 2 marks each and are Very Short Answer type and their answer should not exceed 60-90 words attempt any 5.
- (iv) Section-C consists of questions 25-30 carrying 3 marks each and are Short Answer type and their answer should not exceed 100-150 words. Attempt any 5.
- (v) Section-D consists of questions 31-33 carrying 4 marks each and are case studies. There is an internal choice available.
- (vi) Section-E consists of questions 34-37 carrying 5 marks each and are Long Answer type and their answer should not exceed 200-300 words. Attempt any 3.

SECTION-A

(All Questions are Compulsory)

1. Which one of the following is a post-competition responsibility of the technical committee?
(A) Requisition to purchase equipment
(B) Arrangement of equipment and stationery
(C) Arrangement of officials
(D) Maintenance of the field

Ans :

(D) Maintenance of the field

The technical committee's post-competition responsibility includes maintaining the field to ensure its usability for future events. Pre-competition tasks include arranging officials, equipment, and stationery, while purchasing requisitions are administrative duties handled separately.

2. Which of the following is an objective of Intramural tournaments?
(A) To achieve high performance at the highest level of the tournament.
(B) To develop the feeling of integration with other institutions.
(C) To provide opportunities for choosing a career in sports.
(D) To promote health and recreation at the institution.

Ans :

(D) To promote health and recreation at the institution

Intramural tournaments are organized within an institution to encourage students' participation in sports for health, recreation, and enjoyment rather than high-level performance or career selection, which is the goal of extramural tournaments.

3. Which of the following deformity is NOT related to lower extremities?

- (A) Knock-Knee
- (B) Scoliosis
- (C) Bow-legs
- (D) Flat-foot

Ans :

(B) Scoliosis

Scoliosis is a spinal deformity involving lateral curvature, affecting the upper body rather than the lower extremities. Knock-knee, bow-legs, and flat-foot are all deformities related to the lower extremities, impacting gait and posture.

4. Brisk walking, running, bicycling, and jumping are related to which activities?

- (A) Speed activities
- (B) Strength activities
- (C) Endurance activities
- (D) Co-ordinative activities

Ans :

(C) Endurance activities

Brisk walking, running, bicycling, and jumping require sustained effort over time, improving

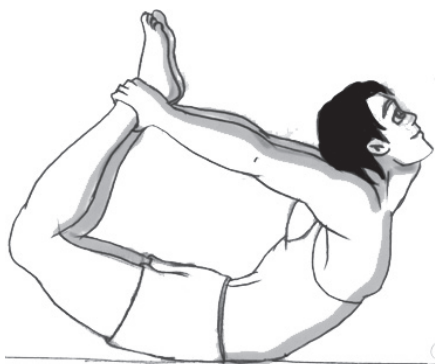
cardiovascular and muscular endurance. Speed activities focus on short bursts, strength activities enhance power, and coordinative activities improve motor skills.

5. As per prescribed syllabus, Suryabhedan Pranayam is recommended for -----
 (A) Obesity
 (B) Hypertension
 (C) Asthma
 (D) Back pain

Ans :

(C) Asthma
 Suryabhedan Pranayama improves lung capacity, enhances oxygen intake, and clears respiratory blockages, making it beneficial for asthma patients. It stimulates the sympathetic nervous system, improving airflow in the lungs. Though it also helps in hypertension, its primary benefit is respiratory improvement.

6. Identify the asana:



- (A) Chakrasana
 (B) Dhanurasana
 (C) Halasana
 (D) Ushtrasana

Ans :

(B) Dhanurasana
 The asana depicted shows a bow-like posture, characteristic of Dhanurasana (Bow Pose). Chakrasana (Wheel Pose) involves a backbend, Halasana (Plow Pose) involves bending forward, and Ushtrasana (Camel Pose) is a kneeling backbend.

7. Given below are two statements, one of which is labelled as Assertion (A) and the other is labelled as Reason (R). Read both the statements carefully:

Assertion (A): The International Paralympic Committee (IPC), has developed a classification process which can contribute “to sporting excellence for all athletes and sports in the Paralympic Movement, and provide equitable competition.”

Reason (R): The classification process serves two roles. The first is to determine who is eligible and the second is to grouping the sports people for the purpose of competitions.

In the context of the above two statements, which one of the following is correct?

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.

Ans :

(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

The Paralympic classification ensures fair competition by categorizing athletes based on abilities, making the sport equitable. The reason explains this classification process accurately.

8. ----- are the colours, that represent the four regional confederation in the Deaflympic logo.

- (A) Red, blue, black and yellow
 (B) Blue, yellow, black and red
 (C) Red, blue, yellow and green
 (D) Blue, black, red and yellow

Ans :

(C) Red, Blue, Yellow, and Green

The Deaflympic logo consists of Red, Blue, Yellow, and Green, representing the four regional confederations of the International Committee of Sports for the Deaf (ICSD). These colors symbolize inclusivity and unity in Deaf sports.

9. What type of lever has the load resistance between the fulcrum and the force?
 (A) First class lever
 (B) Second class lever
 (C) Both (A) and (B)
 (D) Third class lever

Ans :

(B) Second class lever

In a second-class lever, the load is positioned between the fulcrum and the effort, as in a wheelbarrow. First-class levers have the fulcrum between effort and load, and third-class levers have effort between fulcrum and load.

10. The scientific name of Vitamin C is _____.

- (A) Betadine acid
- (B) Ascorbic acid
- (C) Acetonic acid
- (D) Hydrochloric acid

Ans :

(B) Ascorbic acid

The scientific name of Vitamin C is ascorbic acid, which is essential for collagen synthesis, immunity, and antioxidant protection. Betadine acid and acetonic acid are incorrect, and hydrochloric acid is a digestive acid in the stomach.

11. Given below are two statements, one of which is labelled as Assertion (A) and the other is labelled as Reason (R). Read both the statements carefully:

Assertion (A): The risk of cancer can be reduced by eating more colourful vegetables, fruits and other plant-foods that have certain phytochemicals in them.

Reason (R): Non-nutritive components of diet are part of a balanced diet.

In the context of the above two statements, which one of the following is correct?

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

Ans :

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

Phytochemicals in colorful plant foods reduce cancer risk. Though non-nutritive components contribute to a balanced diet, they do not directly explain phytochemicals' role in cancer prevention.

12. In which test, score is recorded to the nearest centimetre between the initial and final score?

- (A) Partial curl-up

(B) Back stretch test

(C) Sit and reach test

(D) Chair sit and reach test

Ans :

(C) Sit and reach test

This test measures flexibility and is recorded in centimeters by assessing how far a person can reach while seated. Other tests assess muscular endurance, back flexibility, or mobility.

13. Given below are types of fractures in List – I with their features in List – II:

	List – I (Types of Fractures)		List – II (Features)
a.	Transverse	i.	Bone breaks diagonally
b.	Oblique	ii.	Bone is crushed into a number of pieces
c.	Green stick	iii.	Straight break right across a bone
d.	Comminuted	iv.	Soft bone, in which bone bends

Match the items of List – I with List – II and choose the correct option from the following:

- | | | | | |
|-----|-----|-----|-----|----|
| | a | b | c | d |
| (A) | iii | iv | ii | i |
| (B) | iii | i | iv | ii |
| (C) | i | ii | iii | iv |
| (D) | ii | iii | iv | i |

Ans :

(B) a-iii b-i c-iv d-ii

1. Transverse (iii) – Straight break across bone.
2. Oblique (i) – Bone breaks diagonally.
3. Greenstick (iv) – Soft bone bends, common in children.
4. Comminuted (ii) – Bone is crushed into multiple fragments.

Thus, option (B) is correct, not (A).

14. “The golf ball remains at rest until it is struck by a golf club.” This statement indicates –

- (A) Law of Inertia
- (B) Law of Acceleration
- (C) Law of Gravity
- (D) Law of Reaction

Ans :

(A) Law of Inertia

Newton's first law states that an object at rest stays at rest until an external force acts on it. A golf ball remains stationary until struck by the club.

15. Given below are traits of the big five theories of personality in List – I with their characteristics in List – II:

	List – I (Traits of Big 5)		List – II (Characteristics)
(a)	Openness	i.	Active, optimistic and social
(b)	Extroversion	ii.	Insecure, nervous and anxious
(c)	Neuroticism	iii.	Creative, focused on tackling new challenges and curious
(d)	Agreeableness	iv.	Friendly, helpful and trustworthy

Match the items of List – I with List – II and choose the correct option from the following:

- a b c d
- (A) iii i iv ii
- (B) iii i ii iv
- (C) iv iii i ii
- (D) iv i ii iii

Ans :

- (B) a-iii b-i c-ii d-iv
- (a) Openness - (iii) Creativity, curiosity
- (b) Extroversion - (i) Sociability, optimism
- (c) Neuroticism - (ii) Nervousness, anxiety
- (d) Agreeableness - (iv) Friendliness, trustworthiness

16. The concept of _____, generally refers to a person's evaluation of, or attitude towards, him or herself.
- (A) Mental-imagery
- (B) Self-esteem
- (C) Self-talk
- (D) Goal-setting

Ans :

(B) Self-esteem

Self-esteem refers to an individual's evaluation of self-worth, influencing confidence and performance. Mental imagery, self-talk, and goal-setting are psychological skills for motivation.

17. The Swedish word speed play is also known as _____.
- (A) Fartlek training
- (B) Interval method
- (C) Continuous method
- (D) Pace method

Ans :

(A) Fartlek training

"Fartlek" (Swedish for "speed play") involves varied-paced running to build endurance and speed, combining steady-state and interval training.

18. In which type of exercises movement can NOT be seen directly?
- (A) Iso-tonic
- (B) Iso-kinetic
- (C) Iso-metric
- (D) Plyometric

Ans :

(C) Iso-metric

In isometric exercises, muscles contract without visible movement, like planks. Isotonic and plyometric exercises involve movement, and isokinetic exercises require specialized equipment for controlled resistance.

SECTION-B

(Attempt any 5 questions)

19. Suggest any two corrective measures for each, bow legs and round shoulders.

Ans :

- Bow Legs:
 - Bracing and Footwear: Use of corrective braces or special footwear as recommended by a doctor.
 - Leg Exercises: Strengthening exercises and stretches for the leg muscles to help align the bones.
- Round Shoulders:
 - Chest Stretching & Back Strengthening: Regular stretching of the pectoral (chest) muscles and exercises (like scapular retractions) to strengthen the upper back.
 - Posture Correction: Maintaining proper sitting and standing posture and using ergonomic supports if needed.

- 20.** Enlist four benefits of participation in physical activities for children with special needs.

Ans :

Four advantages are:

1. **Physical Benefits :** Regular participation helps develop gross and fine motor skills, which improves their coordination, flexibility, and muscle strength.
2. **Psychological Benefits :** It improves the general mood and wellness of CWSN by enhancing their self-esteem, social awareness, and self-confidence.
3. **Social Skills :** Sports and recreational activities provide opportunities for CWSN to engage in social interactions, make friends, and overcome social isolation.
4. **Emotional Health :** Regular exercise is proven to decrease rates of depression and can be a life-changing benefit by improving overall mental and emotional wellbeing.

- 21.** Enumerate any two myths related to food items with their respective facts.

Ans :

Myths Related to Food Items and Their Facts

1. **Myth 1:** “Carrots significantly improve your eyesight.”
Fact: While carrots are rich in vitamin A, they support eye health but do not cure vision problems or drastically improve eyesight.
2. **Myth 2:** “Eating eggs drastically increases cholesterol.”
Fact: Eggs do contain cholesterol, but moderate consumption does not significantly impact blood cholesterol levels in most people.

- 22.** Mention the fitness index score formula and its norms for the Harvard Step Test.

Ans :

Harvard Step Test: Fitness Index Formula and Norms

1. **Formula :** $\text{Fitness Index} = (\text{Duration of exercise in seconds} \times 100) / (2 \times \text{Total of recovery heart rates recorded in three recovery periods})$
2. **Norms:**
 - (i) Above 90: Excellent fitness
 - (ii) 80–90: Good fitness
 - (iii) 55–79: Average fitness
 - (iv) Below 55: Poor fitness

- 23.** Mention any two strategies for enhancing adherence to exercise.

Ans :

Strategies for Enhancing Adherence to Exercise

1. **Set Realistic Goals:** Develop achievable exercise targets and create a structured routine.
2. **Social Support:** Join group activities or partner with a workout buddy for motivation and accountability.

- 24.** When wrestlers fall on the mat, why do they spread their arms, knees, and legs? Justify your answer.

Ans :

When wrestlers fall on the mat, they spread their arms, knees, and legs to increase the body's surface area. This strategy helps distribute the impact force more evenly across the body, thereby reducing the risk of severe injuries—especially to critical areas like the head, neck, and spine. By absorbing the shock over a larger area, the chances of bone fractures or soft tissue injuries are minimized.

SECTION-C

(Attempt any 5 questions)

- 25.** “The organisation of its community sports reflects the progress of any country.” In the context of this statement, outline ‘Run for a specific cause’ and ‘Run for unity’.

Ans :

1. **Run for a specific cause :** This type of run is organized to promote awareness and raise funds for a particular social or environmental issue, such as cancer research, child education, or environmental protection. It mobilizes community members to participate with a clear goal in mind, thus encouraging civic engagement and social responsibility. Such events not only enhance physical fitness but also generate support for a cause, reflecting a nation's commitment to addressing specific societal challenges.
2. **Run for unity :** This run is aimed at fostering community spirit by bringing together people from diverse cultural, social, and economic backgrounds. It promotes harmony

and inclusiveness, reinforcing the idea that sports can be a unifying force in society. By celebrating diversity and solidarity, these events illustrate the progress and forward-thinking nature of a country in nurturing a united community.

- 26.** Describe the physical and psychological benefits of women's participation in sports.

Ans :

1. Physical Benefits
 - (i) Improved Cardiovascular Health: Regular exercise strengthens the heart and increases stamina.
 - (ii) Enhanced Muscular Strength: Sports activities build muscle strength and endurance.
 - (iii) Better Flexibility and Coordination: Participation improves overall body coordination and agility.
 - (iv) Healthy Weight Management: Helps in maintaining an ideal body weight, reducing risks of obesity, diabetes, and heart diseases.
2. Psychological Benefits
 - (i) Boosts Self-Esteem: Increases confidence and a positive body image.
 - (ii) Stress Reduction: Engaging in sports helps in managing stress and lowering anxiety.
 - (iii) Improved Discipline and Focus: Sports encourage goal-setting, persistence, and mental resilience.
 - (iv) Enhanced Social Interaction: Builds strong social networks, fostering community and teamwork.

- 27.** Define flexibility. Explain the methods to improve flexibility for a gymnast.

Ans :

Flexibility : Flexibility is the ability of muscles or muscle groups to lengthen and allow a joint to move through its full range of motion. It is crucial for executing smooth and coordinated movements.

Methods to Improve Flexibility for a Gymnast:

1. Static Stretching : Holding a stretch (15–30 seconds) at the end range of motion helps gradually lengthen muscles. For example, performing splits or backbends improves overall flexibility.
2. Dynamic Stretching : Involves controlled

movements that take muscles through their full range of motion, ideal for warming up. Exercises such as leg swings or arm circles are commonly used.

3. Proprioceptive Neuromuscular Facilitation (PNF) : This advanced technique combines passive stretching with isometric contractions to enhance muscle length when practiced with a partner or coach.
4. Active Isolated Stretching : Repeating brief stretches (1–2 seconds) several times helps improve range without triggering a strong protective reflex.

- 28.** Mention any three importance of diet during competition.

Ans :

1. Energy Provision: A balanced diet supplies the essential carbohydrates, proteins, and fats necessary to fuel the body, ensuring athletes have sustained energy during competition.
2. Rapid Recovery: Proper nutrition aids in muscle repair and replenishes lost nutrients, thereby reducing recovery time and preparing the body for subsequent performance.
3. Enhanced Focus and Performance: Adequate intake of vitamins, minerals, and hydration improves cognitive function, concentration, and overall endurance, leading to better competitive performance.

- 29.** Describe the following:

- (a) Residual Volume
- (b) Stroke Volume

Ans :

- (a) Residual Volume : Residual volume is the amount of air that remains in the lungs after a forceful exhalation. This air cannot be expelled and serves several important functions: it prevents the collapse of the alveoli by maintaining lung volume, ensures continuous gas exchange, and helps keep the lungs moist and functional. This residual air acts as a buffer, safeguarding the lungs from potential damage due to over-expansion or collapse.
- (b) Stroke Volume : Stroke volume refers to the volume of blood ejected by the left ventricle of the heart with each contraction. It is a crucial indicator of cardiac function, reflecting how effectively the heart pumps blood throughout the body. Factors influencing stroke volume

include the strength of the heart's contraction (contractility), the amount of blood filling the heart (preload), and the resistance the heart must overcome to eject blood (afterload).

30. Compare and contrast the hostile and instrumental aggression.

Ans :

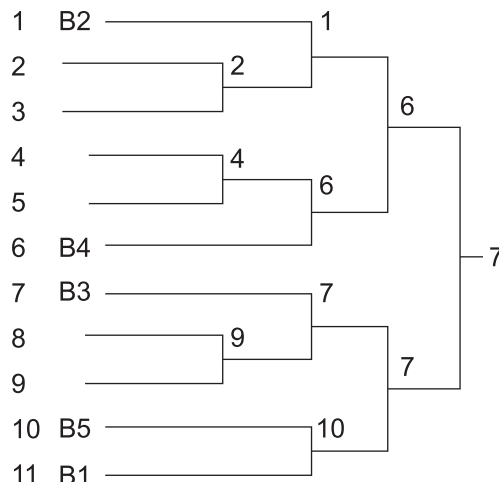
1. Hostile Aggression
 - (i) Definition: Hostile aggression is driven primarily by anger or strong emotions, where the main intent is to inflict pain or harm on someone.
 - (ii) Nature: It is impulsive and reactive; the aggressor acts out of intense emotional arousal without a specific goal beyond causing suffering.
 - (iii) Outcome: This type of aggression often results in regrettable actions since the behavior is not premeditated.
2. Instrumental Aggression
 - (i) Definition: Instrumental aggression is goal-oriented and deliberate, where the aggressive act is a means to achieve a desired outcome (e.g., obtaining a reward or asserting dominance).
 - (ii) Nature: It is calculated and planned; the individual employs aggression as a tool rather than as an expression of emotion.
 - (iii) Outcome: The aggression is more controlled and is used strategically, often in competitive or conflict scenarios.
3. Comparison : Both forms involve harmful behavior, but while hostile aggression is emotionally driven and impulsive, instrumental aggression is premeditated and utilitarian.

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SECTION-D

(Internal Choice Available)

31. Aarti prepared a fixture of 11 teams to conduct a Kho-Kho tournament in her locality as shown below:



Based on the above given fixture, answer the following questions:

- (i) What is the number of Non-bye teams in this tournament?
(A) 06
(B) 07
(C) 08
(D) 09
- (ii) If the above fixture had been of 48 teams, then the number of byes would have been _____.
- (iii) 7th match will be played between team number _____ and _____
or

Write the formula to calculate byes in the lower half.

- (iv) The provision in which good teams are placed in different half or pool, based on their ranking or previous performance not by allotment of draw, so that they do not play with other teams in the first round is known as _____.
(A) Bye
(B) British method
(C) Seeding
(D) American method

Ans :

- (i) Number of Non-bye Teams
For an 11 team knockout, the nearest (next) power of 2 is 16.
 $\text{Byes} = 16 - 11 = 5$
Hence, out of 11 teams, 5 get byes, and the remaining
 $11 - 5 = 6$
teams actually play in the first round.

So, the number of Non-bye teams = 6.

Correct option: (A) 06

- (ii) Number of Byes if There Had Been 48 Teams
For a 48-team knockout, the next power of 2 is 64.

Byes = $64 - 48 = 16$

Hence, there would be 16 byes.

- (iii) 7th Match OR Formula for Byes in the Lower Half

In a typical 11-team knockout, there are 3 first-round matches and 5 byes. After those 3 matches, 3 winners join the 5 bye teams in the second round (8 teams total). The 7th match is usually the fourth match of the second round (if matches are labeled #1–3 for Round 1, and #4–7 for Round 2).

If the fixture is arranged in standard seeding order, the 7th match often comes out as “Team 4 vs Team 5.”

or

$$\text{Byes in Lower half} = \frac{(\text{Total byes}) - 1}{2}$$

- (iv) Provision for Placing Strong Teams in Different Halves

The method of positioning higher-ranked or strong teams in different halves (or pools) so that they do not meet early in the tournament is called Seeding.

Correct option: (C) Seeding

- 32.** During the Physical Education class, Vivek’s physical education teacher provided information about sports for children with special needs. He explained how they are catered for the Paralympics, Deaflympics, and Special Olympics. Additionally, he advised them to motivate such children to participate in physical activities to improve their performance.

Answer the following questions based on the above case and your prior knowledge:

- (i) To participate in Special Olympics, the minimum age should be _____ years old.
(A) 7
(B) 6
(C) 8
(D) 9
- (ii) The first Deaflympics was held in the year _____.
- (iii) Who was the founder of the Paralympics?
- (iv) Write any two strategies to make physical activities accessible for special children.

Ans :

- (i) The correct minimum age is 8 years old. So the correct option is C.
- (ii) The inaugural Deaflympics (originally called the “International Silent Games”) took place in 1924 in Paris.
- (iii) The Paralympics were founded by Dr. (Sir) Ludwig Guttman, who organized the first competition for wheelchair athletes in 1948, paving the way for the modern Paralympic Games.
- (iv) Two strategies to make physical activities accessible for special children:
- (a) Adapted Equipment and Rules: Use modified or specialized equipment (e.g., lighter balls, lower nets) and adjust rules to suit individual abilities, ensuring all children can participate safely and confidently.
- (b) Inclusive Environment and Support: Provide additional support such as trained assistants, accessible facilities (ramps, wider pathways), and a positive, encouraging atmosphere that accommodates different learning paces and physical capabilities.

- 33.** Diya went to a sports training centre for the first time. Her coach informed her that participation in sports not only promotes physical growth but also has social and psychological benefits. He highlighted numerous physical benefits for muscles, heart, and respiratory systems. He advised her to continue daily practice to improve her health-related and skill-related fitness. Answer the following questions based on the above case and your prior knowledge:

- (i) Which is not a long-term effect of exercises on the muscular system?
(A) Hypertrophy of muscle
(B) Increase in glycogen stored
(C) Ligament and tendon strengthen
(D) Accumulation of lactate
- (ii) What is cardiac output?
- (iii) Choose the correct statement related to tidal volume:
(A) Amount of air inhaled and exhaled in one breath.
(B) Amount of air inhaled in one breath.
(C) Amount of blood pumped out by the heart in one stroke.
(D) Amount of air exhaled in one breath.

- (iv) Lactic acid tolerance relates to _____.
 (A) Strength
 (B) Speed
 (C) Flexibility
 (D) Endurance

Ans :

- (i) The correct answer is (D). Accumulation of lactate occurs during intense exercise as a short-term response when the body produces energy anaerobically. Over the long term, regular exercise leads to adaptations like muscle hypertrophy, increased glycogen storage, and strengthening of ligaments and tendons, rather than the persistent buildup of lactate.
- (ii) Cardiac output is the volume of blood pumped by the heart in one minute. It is calculated by multiplying the stroke volume (amount of blood pumped per heartbeat) by the heart rate (number of beats per minute).
- (iii) The correct statement is (A). Tidal volume refers to the volume of air that moves in and out of the lungs during a normal, quiet breathing cycle.
- (iv) The correct answer is (D) Endurance. Lactic acid tolerance is an individual's ability to sustain high-intensity exercise despite the buildup of lactic acid, which is crucial for endurance activities.

SECTION-E

(Attempt any 3 questions)

34. Describe the procedure and benefits of Mandukasana and Makrasana to control hypertension.

Ans :

Mandukasana (Frog Pose)

- Procedure:
 - Stand with feet shoulder-width apart.
 - Slowly bend the knees and lower into a deep squat, ensuring both feet remain flat on the ground.
 - Place your hands on the floor in front of you and slide them forward as you lower your chest, keeping the back straight.
 - Open the knees wider than the feet, mimicking the spread of a frog's legs.
 - Breathe deeply and steadily; hold the pose for 30 seconds to 1 minute, gradually

increasing the duration over time.



2. Benefits for Hypertension:

- Enhances blood circulation, aiding in the reduction of high blood pressure.
- Activates deep, slow breathing that stimulates the parasympathetic nervous system, lowering heart rate and stress.
- Provides a gentle massage to the abdominal organs, contributing to overall relaxation and anxiety reduction.

Makrasana (Crocodile Pose) :

1. Procedure:

- Lie flat on your stomach on a comfortable mat.
- Extend your legs fully while keeping them relaxed.
- Place your arms alongside your body with elbows slightly bent; support your head on your folded arms (or use a cushion for comfort).
- Ensure that the neck and spine maintain a neutral position.
- Focus on slow, deep inhalations and exhalations; hold the pose for 30 seconds to 1 minute, releasing all muscle tension.



2. Benefits for Hypertension:

- Relieves tension in the spine, neck, and shoulders, common areas of stress in hypertensive individuals.
- Reduces cortisol levels and sympathetic nervous system activity, contributing to a lower heart rate.
- Induces mental relaxation, which is crucial for effective blood pressure management.

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- 35.** What do you mean by Equilibrium? Explain how Equilibrium increases with the influence of various factors by giving suitable examples from sports.

Ans :

Equilibrium refers to the state of balance where the body's center of gravity is maintained within its base of support, ensuring stability during both stationary and moving activities. In sports, maintaining equilibrium is essential for performance and injury prevention. Below are key factors and examples that illustrate how equilibrium increases with their influence:

1. **Muscular Strength and Flexibility :** A strong core, along with well-developed leg and back muscles, enhances the body's ability to counteract forces that disturb balance. For instance, in gymnastics, athletes perform routines that require sustained core strength and flexibility to maintain equilibrium during flips and landings.
2. **Sensory Integration :** Equilibrium is highly dependent on the effective integration of visual, vestibular (inner ear), and proprioceptive (body position) inputs. In sports like skiing, athletes rely on visual cues and proprioception to adjust their posture rapidly on uneven terrain, thereby maintaining balance despite external disturbances.
3. **Practice and Skill Development :** Regular training that includes balance exercises, such as yoga or specific balance drills (using balance boards or stability balls), improves neuromuscular coordination. For example, soccer players often train in dynamic balance to manage sudden changes in direction during dribbling or defending, which significantly improves their overall equilibrium.
4. **Equipment and Environment :** Adaptations in sports equipment and playing surfaces can also enhance equilibrium. Athletes using specialized shoes with enhanced grip or training on surfaces designed to challenge stability can develop better balance control, ultimately improving performance.

Overall, equilibrium is a dynamic skill that is refined through targeted training, strength development, and the effective use of sensory feedback, all of which are crucial in sports performance and injury prevention.

- 36.** What do you understand by circuit training? How a coach will plan circuit training sessions with 6 stations to develop fitness of his new trainees? Explain.

Ans :

Circuit Training : Circuit training is a fitness regimen that involves performing a sequence of different exercises at designated stations with minimal rest in between. This training method targets various aspects of physical fitness—including strength, endurance, flexibility, and coordination—in a single session. Its key advantages include enhanced cardiovascular endurance, improved muscular strength, and overall body conditioning, making it particularly effective for new trainees who require a well-rounded introduction to physical training.

Planning a 6-Station Circuit Training Session for New Trainees:

1. **Assessment and Goal Setting :** The coach begins by assessing the trainees' current fitness levels and setting realistic goals. This ensures the selected exercises are suitable for beginners while progressively challenging them.
2. **Station Design :** A balanced circuit is designed with 6 stations, each focusing on a different fitness component:
 - (i) **Station 1 – Warm-up/Cardio :** Light exercises such as jumping jacks or skipping rope to raise heart rate.
 - (ii) **Station 2 – Upper Body Strength :** Exercises like push-ups or wall presses to build upper body muscles.
 - (iii) **Station 3 – Lower Body Strength :** Squats or lunges to strengthen leg muscles and improve stability.
 - (iv) **Station 4 – Core Stability :** Planks or sit-ups to enhance abdominal strength.
 - (v) **Station 5 – Flexibility/Balance :** Dynamic stretches or balance drills to improve coordination.
 - (vi) **Station 6 – Agility/Coordination :** Ladder drills or cone runs to boost speed and neuromuscular coordination.
3. **Execution and Timing :** Each station is allocated 30–60 seconds of work, with a brief transition of 15–20 seconds between stations. This allows trainees to move quickly and keep their heart rates elevated, promoting cardiovascular benefits.
4. **Progression and Monitoring :** The coach can

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gradually increase the duration, intensity, or number of rounds as trainees' fitness improves. Continuous monitoring and adjustments ensure safety, proper form, and steady improvement.

- 37.** Write in detail the procedure and scoring of 'Flamingo Balance Test' and 'Plate Taping Test' recommended for the age group 5 – 8 years by SAI Khelo India.

2025

1. Flamingo Balance Test

Procedure:

- (i) The child is asked to stand on one leg (usually the dominant leg) on a narrow beam or a pre-marked line on the floor.
- (ii) The non-supporting leg is flexed at the knee and held against the standing leg.
- (iii) The child is required to maintain this single-leg stance for a predetermined duration, typically 60 seconds.
- (iv) During the test, the examiner observes and counts the number of times the child loses balance. A loss of balance is noted when the raised foot touches the ground or when the child moves the supporting foot from its original position.



Scoring:

- (i) The fewer the number of balance losses (or "errors"), the better the child's static balance ability.
- (ii) The raw count of balance losses is compared with age-specific normative data provided by SAI Khelo India to assess the child's performance.
- (iii) A lower error count indicates superior balance control, while a higher count suggests a need for targeted balance training.

2. Plate Taping Test

Procedure:

- (i) The child sits comfortably at a table with a plate positioned before them.
- (ii) The plate is marked with a series of dots or targets.
- (iii) Using a pencil (or a similar marker), the child is instructed to tap on the dots as rapidly as possible within a fixed time frame, usually 15 to 20 seconds.
- (iv) The test emphasizes speed, hand-eye coordination, and motor agility.



Scoring :

- (i) The total number of taps completed within the allotted time is recorded.
- (ii) Higher tap counts reflect better hand-eye coordination, speed, and overall motor proficiency.
- (iii) Scores are then compared against established age-specific benchmarks to evaluate the child's neuromuscular coordination.

These tests are simple, non-invasive, and effective in providing insights into the balance and coordination skills of young children, which are crucial for their overall motor development and performance in various sports.

END

CHAPTER 1

MANAGEMENT OF SPORTING EVENTS

SUMMARY

1. FUNCTIONS OF SPORTS EVENTS MANAGEMENT

At the core of effective sports event management are five interrelated functions:

1.1 Planning

Planning is the foundational function and is described as the process of setting a clear future course of action. It involves establishing well-defined objectives, goals, and targets that are specific, logical, flexible, and comprehensive. A robust plan anticipates future challenges and opportunities and delineates the strategies needed to achieve the desired outcomes. In sports events, planning is essential to ensure that every aspect of the event—from logistics and scheduling to staffing and resource allocation—is designed to support the overall vision. It provides a roadmap that integrates all other management functions and ensures that every participant and stakeholder is aligned with the event's objectives.

1.2 Organizing

Once a plan is in place, organizing is the next critical function. This stage involves translating the strategic plan into concrete actions. Organizing includes distributing resources, defining roles and responsibilities, and establishing an efficient structure through organizational charts. This function ensures that all necessary tasks are allocated appropriately and that there is a clear chain of command and reporting relationships. Effective organizing transforms the theoretical blueprint into practical steps that can be executed on the ground, ensuring that every team member knows their duties and that resources are optimally utilized.

1.3 Staffing

Staffing is focused on human resource management, ensuring that the right people are selected, recruited, trained, and placed in positions where they can contribute most effectively. In the context of sports events, staffing involves identifying key positions such as event directors, coordinators, and support staff, and then carrying out recruitment processes to secure qualified individuals. This function also includes orientation and continuous professional development to ensure that staff are well-informed about the event's objectives, policies, and operational procedures. Effective staffing is crucial for building a competent team that can handle the dynamic challenges of sports event management.

1.4 Directing

Directing, often associated with leadership, is about guiding and motivating the team to execute the plan effectively. This function involves clear communication, supervision, and the ongoing motivation of staff. It ensures that everyone is aware of what needs to be done, by whom, and within what timeframe. Directing is essential for fostering a collaborative environment, resolving issues in real time, and ensuring that the execution of the plan remains aligned with the overall strategic objectives. Through effective directing, managers can inspire their teams to perform at their best and overcome any obstacles that may arise during the event.

1.5 Controlling

Controlling is the function that involves monitoring progress and performance against the established standards. It includes setting performance metrics, measuring actual outcomes, and identifying any deviations from the planned course. In sports event management, controlling is critical to ensure that every element of the event is executed as intended. This function involves corrective actions where necessary and

ensures that the event remains on track, both in terms of quality and schedule. Controlling also plays a significant role in post-event evaluations, providing insights into what worked well and what could be improved for future events.

2. VARIOUS COMMITTEES & THEIR RESPONSIBILITIES

To manage the complex tasks involved in organizing a sports event, the syllabus details the formation of several specialized committees. Each committee is designed to address specific operational areas and is structured to work in different phases of the event: pre-event, during the event, and post-event.

2.1 Technical Committee

This committee is responsible for the technical aspects of the sports event. Its responsibilities include procuring sports equipment, ensuring the timely conduct of matches by coordinating with officials such as referees, umpires, and judges, and setting up the playing fields. Before the event, the technical committee prepares requisitions for equipment, organizes the layout of the venue, and finalizes the rules and regulations. During the event, it ensures that matches run smoothly and that all technical equipment is functioning correctly. Post-event, the committee manages the cleaning, maintenance, and storage of equipment.

2.2 Logistics Committee

The logistics committee has a broad mandate that encompasses transportation, accommodation, refreshment, decoration, and ceremonial activities. Its role is to ensure that all logistical aspects of the event are addressed. This includes managing the opening and closing ceremonies, coordinating with vendors, arranging for medical facilities, and overseeing the movement of participants and spectators. The logistics committee operates in all three phases of the event, ensuring that there is seamless coordination between different logistical elements to create a well-organized event environment.

2.3 Finance Committee

Financial oversight is critical in any sports event, and the finance committee is tasked with managing budgets, securing sponsorships, and handling all monetary transactions. This committee prepares the budget, tracks inflows and outflows of funds,

and ensures that all expenditures are justified and within limits. Its responsibilities span the entire duration of the event—from preparing financial plans and finalizing sponsorship agreements before the event, to managing payments during the event, and conducting post-event financial audits and reporting.

2.4 Marketing Committee

Promoting the event and attracting sponsors and participants is the primary function of the marketing committee. This team develops strategies for publicity, works with various media outlets, and organizes promotional campaigns. It uses traditional and digital media channels to generate excitement and visibility for the event. The marketing committee is also responsible for managing public relations, preparing press releases, and ensuring that the event's brand is consistently represented throughout its duration. The formation and effective functioning of these committees are essential for the smooth execution of sports events. They ensure that all aspects—from technical details and logistics to finances and marketing—are managed by specialized teams, which in turn contribute to the overall success of the event.

3. FIXTURES AND THEIR PROCEDURES

Fixtures refer to the scheduled arrangements of matches or games within a tournament. The syllabus outlines various procedures and methodologies for drawing fixtures in different tournament formats, including knockout, league, and combination tournaments.

3.1 Knockout Tournaments

In knockout tournaments, teams or players are eliminated after a loss, making each match critical. The process of drawing fixtures in this format involves calculating the total number of matches (using the formula: number of teams minus one), and then organizing the teams into two halves (upper and lower). When the number of participating teams is not a perfect power of two, byes are assigned to certain teams to balance the bracket. The syllabus explains how byes are allocated and the importance of seeding—a process used to ensure that higher-ranked teams are not pitted against each other in the early rounds. Seeding maintains competitive balance and heightens spectator interest by preserving matchups between strong teams for later rounds.

3.2 League or Round Robin Tournaments

In a league or round robin tournament, every team plays against every other team. The scheduling process here is more complex, involving various methods such as the staircase, cyclic, and tabular methods. These approaches are designed to ensure that the fixtures are arranged in a systematic and fair manner, with each team having an equal opportunity to compete against all others. The total number of matches in such tournaments is calculated using the formula $n(n-1)/2$, where n represents the number of teams. Additionally, the syllabus discusses the rules for determining rankings, including points for wins, draws, and losses, and how tie-breakers are resolved.

3.3 Combination Tournaments

Combination tournaments are hybrid formats that incorporate elements of both knockout and league systems. They are particularly useful when the number of teams is large, or when organizers want to balance the thoroughness of a league format with the excitement of a knockout stage. In these tournaments, teams may first participate in a league phase, and the top teams then advance to a knockout phase. This structure allows for comprehensive competition during the league phase while ensuring that the final stages of the tournament are competitive and elimination-based.

4. INTRAMURAL & EXTRAMURAL TOURNAMENTS

4.1 Intramural Tournaments

Intramural tournaments are conducted within the confines of a single institution, such as a school or college. They are designed to encourage participation from all members of the institution, promoting a sense of community and camaraderie. The objectives of intramural events include fostering physical fitness, developing sportsmanship, and providing a platform for individuals to engage in healthy competition in a controlled and supportive environment. These tournaments help in the early identification of talent and serve as a foundation for future competitive events.

4.2 Extramural Tournaments

Extramural tournaments extend beyond the boundaries of a single institution, involving participants from multiple schools, colleges, or

community organizations. These events aim to achieve higher levels of competition and are often used as qualifiers for regional, national, or international competitions. The objectives of extramural tournaments include promoting excellence in sports, facilitating inter-institutional exchange, and enhancing the overall competitive spirit among participants. Extramural competitions are also significant in providing opportunities for career advancement in sports and in fostering social, cultural, and economic integration.

5. COMMUNITY SPORTS PROGRAMS

Community sports is a community-driven initiative that connects and encourages individuals to engage in sports, exercise, and fitness activities. It acts as a vital foundation for promoting health initiatives among diverse groups, including school children, adults, seniors, and various socially vulnerable populations.

5.1 Sports Day

Sports Day is a hallmark event in many schools and communities. It is designed not only to showcase athletic talent but also to promote community bonding. Sports Day events are often characterized by a wide range of activities that allow participants to demonstrate their abilities, foster teamwork, and build community spirit.

5.2 Health Run

Health Runs are organized to promote fitness and well-being while also raising awareness about health issues. These runs may be linked to charity events or public health campaigns, emphasizing the importance of physical activity in maintaining a healthy lifestyle. They often attract large numbers of participants, including families and community members.

5.3 Run for Fun

Run for Fun events focus on participation and enjoyment rather than competition. They are designed to be inclusive and engaging, encouraging individuals of all fitness levels to take part. These events often incorporate fun elements and are organized to create a relaxed, festive atmosphere that promotes regular physical activity.

5.4 Run for a Specific Cause

These events are organized with a specific social or charitable objective in mind. Participants

run to raise funds or awareness for issues such as environmental conservation, disease prevention, or social justice. Such events help mobilize community support for important causes while promoting physical health.

5.5 Run for Unity

Run for Unity events are designed to bridge cultural, social, or regional divides. They focus on bringing together people from different backgrounds to participate in a common physical activity, thereby fostering a sense of shared purpose and community cohesion. These events help build stronger bonds among community members and promote social integration.

MULTIPLE CHOICE QUESTION

1. Given below are functions of Sports Management in List-I and their Explanation in List-II:

	List-I		List-II
I.	Planning	1.	It is a function of guiding, inspiring and instructing people to accomplish organizational goals.
II.	Controlling	2.	Preparing a layout for the future course of action.
III.	Directing	3.	Ensuring that proper talent is serving that specific job
IV.	Staffing	4.	Establishing performance standards, measuring actual performance and comparing them for irregularities.

Match the items of List-I with List-II and choose the correct option from the following:

- | | | | | |
|-----|---|----|-----|----|
| | I | II | III | IV |
| (a) | 1 | 2 | 3 | 4 |
| (b) | 1 | 2 | 4 | 3 |
| (c) | 2 | 4 | 1 | 3 |
| (d) | 2 | 4 | 3 | 1 |

Ans :

2024

- (c) I-2, II-4, III-1, IV-3

Planning sets future goals, controlling checks performance, directing motivates and guides, while staffing ensures right personnel fit the roles to meet organizational objectives effectively.

2. In planning, defining procedure means
- Setting goals
 - Making a policy
 - Formation of rules and regulation
 - Defining course of action.

Ans :

Term-I, 2021-22

- (d) Defining course of action

Defining procedure in planning implies establishing a systematic course of action to achieve objectives, including formulating policies, rules, and regulations. It involves outlining steps and strategies for effective implementation, ensuring clarity and coordination among team members, thereby driving organizational performance.

3. If you want to be on the top position in games and sports, you have to adhere to proper sports planning. The attainment of good performance in the field of games and sports depends on effective planning. Following are the objectives of planning, except-
- Goal orientation
 - Making strategies
 - Facilitate recreation
 - Formation of rule and regulation.

Ans :

Term-I, 2021-22

- (c) Facilitate recreation

Planning in sports management aims at setting objectives, formulating strategies, and establishing operational guidelines. It does not include facilitating recreation because recreation is not a strategic objective. Thus, option (c) is excluded since it does not align with planning goals.

4. Logistics committee deals with
- Accommodation
 - Transportation
 - Medical Staff
 - All of the above

Ans :

Term-I, 2021-22

- (d) All of the above

The logistics committee in sports management is responsible for coordinating various essential services including accommodation, transportation, and medical support. By handling these multiple aspects, the committee ensures that all logistical

requirements are met efficiently during events for successful event execution

5. Choose odd one from the check list of organising a sports event.

- (a) Accommodation
- (b) Place of event
- (c) Art integration
- (d) Sponsorship

Ans :

Term-I, 2021-22

- (c) Art integration

Among organizing factors, accommodation, venue, and sponsorship are critical logistical considerations, whereas art integration does not directly contribute to event organization. Art integration is more about creative presentation, making it the odd one out among practical organizing elements of events.

6. If odd numbers of teams are participating in a Round Robin tournament, then the formula for calculating number of rounds is

- (a) $N - 1$
- (b) $N(N - 1)/2$
- (c) N
- (d) $N + 1$

Ans :

Term-I, 2021-22

- (c) N

In a Round Robin tournament with an odd number of teams, the number of rounds equals the number of teams. Each round, one team receives a bye, allowing every team to compete against all others once during the tournament properly.

7. IPL cricket tournament is an example of

- (a) Knock-out Tournament
- (b) League Tournament
- (c) Combination Tournament
- (d) Single League Tournament.

Ans :

Term-I, 2021-22

- (b) League Tournament

The IPL cricket tournament operates as a league format where teams play multiple matches across rounds. This structure contrasts with knockout formats, providing ample opportunity for teams to accumulate points and improve rankings over the season's schedule for sustained success.

8. In a knockout tournament, 4th Bye will be given to

- (a) Last team of Lower half
- (b) Last team of Upper half

- (c) First team of Upper half
- (d) First team of Lower half.

Ans :

Term-I, 2021-22

- (b) Last team of Upper half

In knockout tournaments, byes are allocated to balance brackets. The 4th bye is typically assigned to the last team in the upper half of the draw. This arrangement ensures fair progression, allowing stronger teams to advance while maintaining bracket integrity.

9. Archana a P.E. Teacher of ABC School, sent invitations to 26 teams to play Kho-Kho under Khelo India programme. All teams accepted the invitation. Now, help Archana and suggest her which type tournament she should organise to make the competition successful.

- (a) Knock-out tournament
- (b) League tournament
- (c) Round Robin tournament
- (d) Berger tournament

Ans :

Term-I, 2021-22

- (a) Knock-out Tournament

For a large number of teams in Kho-Kho, a knock-out tournament is ideal. It streamlines the competition by eliminating teams after each match, ensuring swift progression towards a winner and keeping the tournament schedule manageable despite numerous entries, efficient structure.

10. League tournament is also known as:

- (a) Round robin
- (b) Consolation
- (c) Knock-out
- (d) Challenge.

Ans :

2021 C

- (a) Round Robin

A league tournament, commonly called a Round Robin fixture, requires each team to play every other team. This format ensures fair competition by giving equal opportunity for all teams to compete, accumulate points, and demonstrate consistent performance over multiple matches.

11. Which one of the following is an advantage of round robin tournament?

- (a) Time-consuming
- (b) More number of officials
- (c) Expensive
- (d) Decides the real strong team.

Ans :

2020 C

(d) Decides the real strong team.

A round robin tournament's advantage lies in its comprehensive structure where each team plays against all opponents. This format minimizes the chance of early elimination of strong teams, ensuring the most consistent and strongest team emerges as the overall winner.

- 12.** How many total matches will be played in a knock-out fixture of 19 teams?

(a) 18
(b) 17
(c) 20
(d) 16

Ans :

2023

(a) 18

In a knockout tournament, the total number of matches equals the number of teams minus one. For 19 teams, this calculation results in 18 matches, as every match eliminates one team, leading to a single winner by sequential elimination efficiently.

- 13.** In a knockout tournament, if byes are in odd numbers then number of byes in lower half is calculated by

(a) $\frac{NB+1}{2}$
(b) $\frac{NB-1}{2}$
(c) $\frac{NB}{2}$
(d) $NB-1$

Ans :

Term-I, 2021-22

(a) $\frac{NB+1}{2}$

When the number of byes in a knockout tournament is odd, the lower half receives an additional bye calculated as $NB + 1/2$. This formula ensures both halves remain balanced, allowing fair progression with proper scheduling for tournament integrity overall.

- 14.** In a knockout tournament, if 9 teams are participating then number of byes in upper half will be

(a) 3
(b) 4
(c) 5
(d) 2

Ans :

Term-I, 2021-22

(a) 3

With nine teams participating in a knockout tournament, the upper half of the bracket needs

byes to balance structure. In this scenario, three byes are assigned in the upper half, ensuring equitable match distribution and proper bracket progression for fairness.

- 15.** How many matches will be played in 2nd round, if 14 teams are participating in a knockout tournament?

(a) 3
(b) 2
(c) 4
(d) 6

Ans :

Term-I, 2021-22

(c) 4

In a knockout tournament with 14 teams, the initial round arrangements determine the second round's structure. With appropriate byes and match pairings, the second round results in four matches, ensuring elimination and advancement towards subsequent tournament stages.

- 16.** Match the following :

	List-I		List-II
P	Marketing Committee	i	Head of organising committee
Q	Chairperson	ii	Responsible for liaison with Print Media
R	Tournament	iii	Series of contest between a number of competitors
S	Fixture	iv	A sports match that has been arranged for a particular time and date

Select the correct answer :

P Q R S
(a) ii i iii iv
(b) ii i iv iii
(c) i ii iii iv
(d) i ii iv iii

Ans :

Term-I, 2021-22

(b) P-ii, Q-i, R-iv, S-iii

The matching exercise associates roles with responsibilities. The marketing committee liaises with print media, while the chairperson heads the organizing committee. The tournament refers to a series of contests and the fixture signifies a scheduled match, making option (b) correct.

17. The total number of matches in a knock out tournament of 34 teams are

(a) 31
(b) 32
(c) 33
(d) 35

Ans :

SQP 2020

(c) 33

In knockout tournaments, every match eliminates one team, meaning total matches equal teams minus one. For 34 teams, this logic dictates that 33 matches are required, as each game progresses the competition until a single champion remains, confirming option (c).

18. Which of the following is the objective of Intramural competition?

(a) To achieve high performance
(b) To provide career opportunities
(c) To promote health and fitness
(d) To promote cultural and economic development

Ans :

2024

(c) To promote health and fitness

Intramural competitions primarily aim to enhance physical well-being by encouraging active participation among students. These events focus on promoting health and fitness rather than professional sports achievement, thereby creating an inclusive environment that benefits overall well-being and active lifestyle development.

19. The primary goal of Intramural competition is
- (a) To provide opportunity for mass participation of students
(b) To participate in inter-school competition
(c) To provide intra-school competition
(d) All of the above.

Ans :

COMP 2020

(d) All of the above.

Intramural competitions serve multiple purposes including providing mass participation opportunities, intra-school competition, and inter-school contests. This multifaceted approach fosters inclusivity, competitive spirit, and skill development among students, thus making all listed objectives collectively important, ensuring comprehensive educational athletic growth overall.

20. Identify which one of these is not the objective of Planning?

(a) Enhance creativity
(b) Increase efficiency
(c) Reduce chances of mistake
(d) Facilitates poor coordination

Ans :

Term-I, 2021-22

(d) Facilitates poor coordination

Planning in sports management is intended to enhance creativity, increase efficiency, and reduce errors. Facilitating poor coordination contradicts these objectives. Therefore, option (d) does not represent a valid objective, as effective planning strives for improved organization and seamless teamwork consistently.

21. Match the following :

	List-I		List-II
A	Technical committee	I	To provide shifting facility
B	Finance committee	II	To resolve dispute
C	Transport committee	III	To deals with money and expenditure
D	First aid committee	IV	To provide medical facilities.

(a) A-II, B-III, C-I, D-IV
(b) A-III, B-II, C-I, D-IV
(c) A-II, B-III, C-IV, D-I
(d) A-IV, B-III, C-I, D-II

Ans :

Term-I, 2021-22

(a) A-II, B-III, C-I, D-IV

The matching exercise aligns technical committees with dispute resolution, finance with expenditure management, transport with shifting facilities, and first aid with medical services. This precise pairing ensures each committee's responsibility is clearly defined, validating option (a) as the correct match.

22. What is the formula to determine number of matches in League fixture for even number of teams?

(a) $N + 1/2$
(b) $N - 1/2$
(c) $N(N - 1)/2$
(d) $N(N+1)/2$

Ans :

2023-24

(c) $N(N - 1)/2$

For an even number of teams in a league fixture, every team plays all others. The formula $\frac{N(N-1)}{2}$ calculates the total number of matches by combining all possible pairings, ensuring a complete and fair competition structure among participants.

- 23.** How many byes will be given if there are 17 teams?
 (a) 1
 (b) 8
 (c) 15
 (d) 15

Ans :

2022-23

(c) 15

In knockout tournaments, byes are assigned to balance brackets and accommodate non-power-of-two team numbers. For 17 teams, the formula yields 15 byes, ensuring that the competition format adjusts for the uneven number of participants and maintains a structured elimination process.

- 24.** How many matches will be played in a knock-out tournaments first if there are 15 teams?
 (a) 8
 (b) 7
 (c) 5
 (d) 6

Ans :

2022-23

(b) 7

For 15 teams in a knockout tournament, the initial round match count is determined by the number of teams minus available byes. In this configuration, seven matches occur in the first round, ensuring elimination and advancement towards subsequent tournament stages.

- 25.** Consolation tournaments are a part of which type of fixture?
 (a) Knock-out
 (b) League
 (c) Combination
 (d) None of these

Ans :

Term-I, 2021-22

(a) Knock-out

Consolation tournaments are secondary competitions held alongside knockout fixtures. They provide eliminated teams an opportunity to continue playing, ensuring additional competitive experience. Hence, these tournaments form an integral component of the knockout structure, supporting overall participant engagement in event organization.

- 26.** Which fixture is also known as 'Berger system' ?
 (a) Knock-out fixture
 (b) Round robin fixture
 (c) Combination fixture
 (d) Challenge tournament

Ans :

Term-1, 2021-22

(b) Round robin fixture

The Berger system refers to a scheduling method in round robin tournaments where each team competes with every other team. This approach ensures a balanced fixture and match distribution, hence option (b) is the correct identification of the Berger system.

- 27.** ABC School is one of the reputed schools in their location for the number of sports facilities it provides to its stakeholders. Keeping that in consideration CBSE Sports cell has given them the responsibility of conducting CBSE Football cluster. 35 teams have sent their entry for participation in the tournament. Due to the large number of teams willing to participate, the school should conduct the competition by which fixture?
 (a) League
 (b) Knock-out
 (c) Staircase
 (d) Challenge

Ans :

Term-I, 2021-22

(b) Knock out

Given the large number of participating teams in the CBSE Football cluster, a knock-out tournament is optimal. This format reduces the number of matches, quickly eliminating teams until one winner remains, making it logistically feasible for managing extensive entries efficiently.

- 28.** Mr. Gopi, Physical Education Teacher of a reputed CBSE school has decided to conduct an Inter School Kabaddi tournament in his premises after proper drawing of fixtures. He consulted the Management and the Principal to conduct the Tournament of Inter School Kabaddi pattern but the Physical Education Teacher was not aware of Inter School Kabaddi Tournament. So he discussed with the National Kabaddi Referee Association. Which of the following is the best method to organize this kind of tournament?
 (a) Knock out tournament
 (b) League tournament
 (c) Combination tournament
 (d) Round Robin tournament

Ans :

2023-24

(b) League tournament

For inter-school Kabaddi, a league tournament is preferable as it allows all teams to play multiple matches. This format provides fair competition, comprehensive performance evaluation, and ample opportunities for teams to improve, ensuring a well-rounded competitive experience across all schools.

- 29.** What is the formula to divide an odd number of teams in the upper half for a knockout fixture?

- (a) $N + 1/2$
 (b) $N - 1/2$
 (c) $N(N - 1)/2$
 (d) $N(N + 1)/2$

Ans :

Term-I, 2021-22

(a) $N + 1/2$

To allocate byes in a knockout tournament for an odd number of teams, the upper half division uses the formula $N + 1/2$. This calculation ensures proper distribution and balance in the bracket, enabling fair progression in the competition.

- 30.** Formula for determining the number of bye in the lower half of a knock-out fixture, when number of byes are odd?

- (a) $nb + 1/2$
 (b) $nb - 1/2$
 (c) $nb/2$
 (d) $nb + 1$

Ans :

Term-I, 2021-22

(a) $nb + 1/2$

To determine the number of byes in the lower half when byes are odd, use the formula $nb + 1/2$. This adjustment ensures balanced brackets and fair match progression, enabling each half to merge correctly as the tournament advances efficiently.

- 31.** The formula for determining the number of rounds in a single league fixture, when the number of teams is even?

- (a) N
 (b) $N - 1/2$
 (c) $N - 1$
 (d) $N(N - 1)/2$

Ans :

Term-I, 2021-22

(c) $N - 1$

In a single league fixture with an even number of teams, each team competes against every other team once. The number of rounds required is calculated as N minus 1, ensuring that all teams play without repetition in full schedule.

- 32.** How many matches will be played, if there are 22 teams for the knock-out fixture?

- (a) 10
 (b) 21
 (c) 12
 (d) 32

Ans :

Term-I, 2021-22

(b) 21

In a knockout tournament, the total number of matches equals the number of teams minus one. Therefore, with 22 teams, 21 matches are played. This simple elimination rule ensures a progressive reduction of competitors until a champion is determined indeed.

- 33.** How many rounds will be played, if the number of teams are 29 in the knock-out fixture?

- (a) 5
 (b) 6
 (c) 7
 (d) 3

Ans :

Term-I, 2021-22

(a) 5

Determining rounds in a knockout tournament involves calculating successive eliminations until one champion remains. With 29 teams, the tournament structure requires approximately 5 rounds, efficiently accommodating byes and match pairings to achieve a balanced elimination format for optimal progression indeed.

- 34.** Rohan and Satish organised a Volleyball tournament on Knock-out basis. They found that the spectators were losing interest in the tournament because two good teams were out of the tournament as they were defeated in the beginning.

Which provision could have avoided this kind of situation?

- (a) Bye
 (b) Seeding
 (c) Pools
 (d) Halves

Ans :

Term-I, 2021-22

(b) Seeding

Seeding in knockout tournaments arranges teams based on strength, preventing top teams from facing each other in early rounds. This strategic placement ensures that strong teams progress further, maintaining spectator interest and delivering competitive balance throughout the tournament consistently effective.

35. The basic function of management is:

- (a) controlling
- (b) budgeting
- (c) planning
- (d) organising

Ans :

COMP 2017

(c) planning

Planning is the foundational function of management. It involves setting objectives and determining the best course of action to achieve these objectives. Without planning, other management functions like organising, staffing, directing, and controlling cannot be effectively executed.

36. In which of the following functions of sports event management does the “recruitment process” take place?

- (a) Planning
- (b) Staffing
- (c) Controlling
- (d) Directing

Ans :

DELHI 2009

(b) Staffing

Staffing is the function that involves recruitment, selection, and training of personnel needed for an event. It ensures that the right people are in place to carry out the planned activities and manage the event effectively.

37. The Committee responsible for liaison with Print media is the _____ Committee.

- (a) Technical
- (b) Logistics
- (c) Marketing
- (d) Finance

Ans :

OD 2004

(c) Marketing

The Marketing Committee handles communication and public relations, including liaising with the print media. (A) They promote the event, ensure positive publicity, and manage media relations to enhance the event's visibility.

38. Purchase of sports equipment is a work of the _____ Committee.

- (a) Technical
- (b) Logistics
- (c) Marketing
- (d) Finance

Ans :

FOREIGN 2001

(b) Logistics

The Logistics Committee manages the procurement and distribution of equipment and supplies needed for the event. They ensure that all necessary sports equipment is purchased, delivered, and ready for use in a timely and efficient manner.

39. Publication of rules and regulations should be done _____.

- (a) Pre event
- (b) During event
- (c) Post event
- (d) Any time during the event

Ans :

COMP 2007

(a) Pre event

Publishing rules and regulations in the pre-event phase ensures that all participants, officials, and stakeholders are aware of the guidelines. This proactive step minimizes confusion and ensures smooth conduct during the event.

40. After losing a match, a team will be eliminated from the:

- (a) Knockout tournament
- (b) League tournament
- (c) Round Robin tournament
- (d) None of above

Ans :

DELHI 2003

(a) Knockout tournament

In a knockout tournament, teams face immediate elimination upon losing a match. This format intensifies competition and is structured so that only the winning teams progress to the next round, eventually leading to a champion.

41. Which of the following tournament helps save time?

- (a) Knockout tournament
- (b) League tournament
- (c) Combination tournament
- (d) Round Robin tournament

Ans :

OD 2008

(a) Knockout tournament

A knockout tournament is time-efficient because each match eliminates one team. This rapid elimination process reduces the total number of matches needed to determine a winner compared to formats where teams play multiple games.

42. National Sports Day is celebrated on:

- (a) 9th August
- (b) 19th August
- (c) 28th August
- (d) 29th August

Ans :

FOREIGN 2006

- (d) 29th August

National Sports Day in India is celebrated on 29th August, commemorating the birthday of hockey legend Dhyan Chand. This day honors his contributions to sports and promotes the importance of physical activity and sportsmanship nationwide.

43. Which of the races is run “to promote brotherhood”?

- (a) Run for Fun
- (b) Run for specific cause
- (c) Run for Unity
- (d) Health Run

Ans :

SQP 2002

- (c) Run for Unity

A “Run for Unity” is organized to foster a sense of togetherness and promote social harmony among participants. It emphasizes community spirit and encourages people to come together in support of unity and inclusiveness.

44. What is the first function in sports events management?

- (a) Organising
- (b) Planning
- (c) Staffing
- (d) Directing

Ans :

COMP 2010

- (b) Planning

Planning is the first step because it involves setting objectives, determining resources, and outlining strategies, which serve as a foundation for organizing, staffing, directing, and controlling all subsequent activities in sports event management.

45. Which function deals with allocating tasks and resources?

- (a) Planning
- (b) Organising
- (c) Staffing
- (d) Controlling

Ans :

DELHI 2012

- (b) Organising

Organising involves structuring teams, assigning responsibilities, and arranging resources systematically, ensuring that every element is in place for smooth event execution. This supports the overall strategy developed during the planning phase.

46. Which function primarily involves hiring and managing people?

- (a) Directing
- (b) Staffing
- (c) Controlling
- (d) Organising

Ans :

OD 2005

- (b) Staffing

Staffing is about recruiting and assigning the right personnel to various roles. It ensures that individuals with appropriate skills are in place to execute tasks, which is essential for a successful sports event management process.

47. What function involves guiding, instructing, and motivating the team during the event?

- (a) Planning
- (b) Directing
- (c) Organising
- (d) Controlling

Ans :

FOREIGN 2011

- (b) Directing

Directing includes leadership, communication, and motivation to keep the team focused. It ensures that all members understand their roles, maintain enthusiasm, and execute tasks according to the event's strategic plan.

48. Which function is responsible for monitoring progress and implementing adjustments?

- (a) Controlling
- (b) Organising
- (c) Staffing
- (d) Directing

Ans :

SQP 2013

- (a) Controlling

Controlling involves measuring performance against plans, identifying deviations, and taking corrective actions. This function maintains quality, timeliness, and overall coordination throughout the event, ensuring that established goals are successfully met.

49. Which committee handles pre-event activities such as venue selection?
- Post-event Committee
 - Pre-event Committee
 - During-event Committee
 - Operations Committee

Ans :

COMP 2015

- (b) Pre-event Committee

The pre-event committee is responsible for planning, site selection, budgeting, and scheduling. They lay the groundwork by ensuring that all logistical and operational elements are in place before the event begins.

50. Who is in charge of ensuring smooth operations during the event?
- Pre-event Committee
 - During-event Committee
 - Post-event Committee
 - Risk Management Committee

Ans :

DELH 2019

- (b) During-event Committee

The during-event committee manages on-site operations by coordinating logistics, security, and communications. Their real-time decision-making ensures that any issues are promptly addressed, keeping the event running as planned.

51. Which committee analyzes the event's outcomes and collects feedback?
- Pre-event Committee
 - During-event Committee
 - Post-event Committee
 - Media Committee

Ans :

OD 2014

- (c) Post-event Committee

After the event, the post-event committee evaluates performance, gathers feedback, reviews finances, and identifies lessons learned. This analysis is crucial for improving future events and ensuring continual progress in event management practices.

52. Which committee typically coordinates sponsors, media, and logistics on-site?
- Media Committee
 - Operations Committee
 - Risk Management Committee
 - Pre-event Committee

Ans :

FOREIGN 2016

- (b) Operations Committee

The operations committee manages day-of-event activities including sponsor coordination, media relations, and logistical support. They ensure that the event functions smoothly by handling real-time operational challenges efficiently and effectively.

53. Which committee focuses on identifying risks and planning emergency measures?

- Risk Management Committee
- Post-event Committee
- Staffing Committee
- Directing Committee

Ans :

SQP 2018

- (a) Risk Management Committee

The risk management committee identifies potential hazards and develops contingency plans. They assess risks related to safety, security, and operational issues, ensuring that effective measures are in place to mitigate problems during the event.

54. In knockout tournaments, what does a "bye" signify?

- Automatic elimination
- Exemption from playing in the first round
- Extra match played
- Home advantage

Ans :

COMP 2020

- (b) Exemption from playing in the first round

A bye is awarded to a team, allowing them to advance without playing in an initial round, which balances the bracket when the number of teams is not ideal. This mechanism helps maintain fairness in the tournament progression.

55. What is the purpose of seeding in knockout tournaments?

- Random pairing
- Preventing strong teams from meeting early
- Eliminating teams
- Scheduling venues

Ans :

DELHI 2021

- (b) Preventing strong teams from meeting early

Seeding ranks teams based on performance or rankings, ensuring that the strongest teams are distributed evenly throughout the bracket. This minimizes early matchups between top competitors, thereby maintaining an exciting tournament structure.

56. Which league scheduling method arranges matches in a cyclic order?

- (a) Tabular Method
- (b) Staircase Method
- (c) Knockout Method
- (d) Combination Method

Ans :

OD 2007

(b) Staircase Method

The staircase (or cyclic) method organizes fixtures by rotating team matchups in a systematic cycle. This method ensures each team plays various opponents in a balanced manner, maintaining fairness and structure throughout the league competition.

57. What does the tabular method in league tournaments primarily do?

- (a) Creates a bracket
- (b) Lists all matches in a table format
- (c) Determines byes
- (d) Assigns seedings

Ans :

FOREIGN 2003

(b) Lists all matches in a table format

The tabular method organizes fixtures by presenting match schedules in a table. This format makes it easier for organizers and participants to visualize matchups, dates, and venues, thereby enhancing clarity and planning in the tournament.

58. A tournament that combines knockout and league formats is called a:

- (a) Hybrid Tournament
- (b) Combination Tournament
- (c) Mixed Tournament
- (d) Dual Format Tournament

Ans :

SQP 2008

(b) Combination Tournament

A combination tournament integrates elements of both knockout and league systems. This format allows teams to play several matches in a league phase before progressing to a knockout stage, balancing competitive fairness with extended participation.

59. What happens to a team after losing a match in a knockout tournament?

- (a) They play a consolation match
- (b) They are eliminated
- (c) They join a lower bracket
- (d) They get a rematch

Ans :

COMP 2006

(b) They are eliminated

In knockout tournaments, a single loss results in elimination from the competition. This structure ensures a clear progression where teams are progressively removed until the final match determines the overall champion.

60. Which tournament format ensures that every team plays against all others?

- (a) Knockout
- (b) Combination
- (c) League
- (d) Seeding

Ans :

DELHI 2002

(c) League

In a league format, every team competes with every other team. This round-robin system allows for a comprehensive assessment of each team's performance, ensuring maximum participation and a fair opportunity for all to succeed.

61. What is the main goal of seeding in tournament design?

- (a) To randomize matchups
- (b) To rank teams for balanced scheduling
- (c) To eliminate teams early
- (d) To schedule rest days

Ans :

OD 2010

(b) To rank teams for balanced scheduling

Seeding involves ranking teams based on abilities or past performance, ensuring that strong teams are not matched early in the competition. This balanced scheduling creates a fair tournament structure and builds anticipation for later rounds.

62. Intramural tournaments are generally organized for:

- (a) Inter-school competitions
- (b) Community-wide events
- (c) Participants within one institution
- (d) Professional athletes

Ans :

FOREIGN 2005

(c) Participants within one institution

Intramural tournaments are held within a single organization, such as a school or college. Their purpose is to encourage participation, build community spirit, and provide a friendly competitive environment among members of the same institution.

63. Extramural tournaments involve competitions among:

- (a) Teams from the same institution
- (b) Different institutions
- (c) Only professionals
- (d) Individual athletes only

Ans :

SQP 2011

- (b) Different institutions

Extramural tournaments feature teams from various institutions or organizations. They promote inter-institutional competition, fostering a broader competitive environment and providing participants with the opportunity to test their skills against diverse opponents.

64. What is a primary objective of intramural tournaments?

- (a) Professional competition
- (b) Revenue generation
- (c) Participation and social interaction
- (d) National rankings

Ans :

COMP 2013

- (c) Participation and social interaction

Intramural tournaments aim to encourage broad participation and enhance community bonding. They are designed to be inclusive and promote a positive sporting experience, focusing on fun and team building rather than solely on competitive outcomes.

65. Extramural tournaments primarily aim to:

- (a) Limit participation
- (b) Enhance community engagement and competition
- (c) Focus on recreational play
- (d) Restrict access to sports

Ans :

DELHI 2015

- (b) Enhance community engagement and competition

Extramural tournaments bring together teams from different institutions, promoting healthy competition and strengthening community ties. They provide a platform for diverse groups to interact, compete, and learn from each other, increasing overall sportsmanship.

66. Which benefit is most associated with sports tournaments?

- (a) Increasing revenue only
- (b) Promoting physical fitness and teamwork
- (c) Limiting participation
- (d) Reducing social interaction

Ans :

OD 2019

(b) Promoting physical fitness and teamwork
Sports tournaments encourage physical fitness, enhance teamwork, and foster social interaction. They create a supportive environment where participants build relationships, develop skills, and learn cooperation while engaging in competitive and recreational activities.

67. Intramural tournaments are considered less competitive because they:

- (a) Involve different institutions
- (b) Are held over a long period
- (c) Involve participants from the same organization
- (d) Have high prize money

Ans :

FOREIGN 2014

(c) Involve participants from the same organization
Intramural tournaments typically involve members from within the same institution, creating a familiar and less intense competitive environment. This focus on participation and community bonding reduces the pressure compared to inter-institutional competitions.

68. What is the main purpose of a “Sports Day” event in community programs?

- (a) Elite competitions
- (b) Promoting mass participation in sports
- (c) Hosting professional matches
- (d) Exclusive training sessions

Ans :

SQP 2016

(b) Promoting mass participation in sports
Sports Day events are organized to encourage community-wide participation in various sporting activities. They are designed to promote health, fun, and unity among people of all ages and skill levels, creating a festive atmosphere.

69. What is the primary objective of a “Health Run”?

- (a) Identifying the fastest runner
- (b) Raising awareness about health and fitness
- (c) Selecting professional athletes
- (d) Determining team rankings

Ans :

SQP 2018

(b) Raising awareness about health and fitness
A Health Run is designed to promote healthy living and raise public awareness about fitness. Participants engage in a fun run while learning about the benefits of physical activity and healthy lifestyle choices, encouraging community participation.

70. “Run for Fun” events are characterized by:

- (a) High competition levels
- (b) A relaxed, enjoyable atmosphere
- (c) Strict time limits
- (d) Elite athlete participation only

Ans :

COMP 2020

(b) A relaxed, enjoyable atmosphere
“Run for Fun” events emphasize enjoyment over intense competition. They focus on creating a stress-free environment where participants can experience the joy of running, socialize, and promote physical fitness without the pressure of strict competitive performance.

71. “Run for a Specific Cause” events are organized to:

- (a) Increase sponsorship revenue
- (b) Support and raise funds for a charitable cause
- (c) Promote individual competition
- (d) Establish elite status

Ans :

DELHI 2017

(b) Support and raise funds for a charitable cause
These events are designed to mobilize community support around a specific cause, raising funds and awareness for social, medical, or environmental issues. They unite participants to engage in physical activity while contributing to meaningful charitable efforts.

72. What is the main aim of “Run for Unity” events?

- (a) Fostering individual achievements
- (b) Bridging community divisions
- (c) Enhancing competitive rivalries
- (d) Showcasing professional talent

Ans :

OD 2009

(b) Bridging community divisions
“Run for Unity” events are organized to bring together people from diverse backgrounds. Their primary goal is to foster social cohesion and inclusiveness by uniting community members through a shared physical activity, promoting unity and collaboration.

73. Which statement best summarizes the significance of community sports programs?

- (a) They solely focus on elite competition.
- (b) They build community spirit, promote health, and encourage widespread participation.
- (c) They limit sports to professionals only.
- (d) They focus exclusively on financial gains.

Ans :

FOREIGN 2006

(b) They build community spirit, promote health, and encourage widespread participation.

Community sports programs aim to foster unity, enhance public health, and encourage active lifestyles. They engage participants from diverse backgrounds, creating an inclusive environment that benefits both individuals and the wider community through sports and recreational activities.

74. Assertion (A) : Planning is the backbone of sports events management.

Reason (R) : Without planning, subsequent functions like organizing, staffing, directing, and controlling cannot be effectively executed.

Options:

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

Ans :

SQP 2001

(a) Both (A) and (R) are true, and (R) is the correct explanation of (A).

Both statements are true. Effective planning is foundational since it outlines goals and resource allocation, which directly enables the success of organizing, staffing, directing, and controlling functions.

75. Assertion (A) : Pre-event committees play a crucial role in sports events management.

Reason (R) : They are responsible for tasks such as venue selection, budgeting, scheduling, and risk management before the event begins.

Options:

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

Ans :

COMP 2004

(a) Both (A) and (R) are true, and (R) is the correct explanation of (A)

Both statements are correct. The pre-event committee’s responsibilities—planning logistics, budgeting, and risk assessment—directly contribute to the smooth execution of the event, confirming the assertion.

- 76. Assertion (A) :** Seeding in knockout tournaments is crucial for ensuring balanced competition.

Reason (R) : Seeding guarantees that the strongest teams always win the tournament.

Options:

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

Ans :

DELHI 2010

- (c) (A) is true, but (R) is false

The assertion is true—seeding helps to distribute strong teams evenly. However, the reason is false because seeding does not ensure that the strongest teams will always win; it only organizes match-ups to avoid early clashes.

- 77. Assertion (A) :** Extramural tournaments are inherently more competitive than intramural tournaments.

Reason (R) : Extramural tournaments involve teams from different institutions, which naturally increases rivalry and competitive intensity.

Options:

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

Ans :

OD 2005

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A)

Both statements are correct. Involving teams from different institutions raises the level of competition and rivalry compared to intramural events, making the reason the proper explanation for the assertion.

- 78. Assertion (A) :** Directing in sports events management is solely about giving orders during the event.

Reason (R) : Directing also involves motivating, guiding, and communicating effectively with team members to ensure smooth event execution.

Options:

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

- (c) (A) is true, but (R) is false.

- (d) (A) is false, but (R) is true.

Ans :

FOREIGN 2011

- (d) (A) is false, but (R) is true

The assertion is false because directing encompasses more than just giving orders; it also includes motivation and guidance. The reason is true, making option (d) correct.

- 79. Assertion (A) :** The cyclic (staircase) method in league scheduling ensures that each team faces various opponents in a rotating order.

Reason (R) : It arranges matches in a fixed sequential order that does not necessarily explain how balanced competition is achieved.

Options:

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

Ans :

SQP 2013

- (b) Both (A) and (R) are true, but (R) is not the correct explanation of (A)

The assertion is true, and while the reason correctly describes the cyclic method's match arrangement, it does not explain why this method ensures balanced competition. Hence, both are true but not causally linked

- 80.** In sports events management, _____ is the process of defining objectives, strategies, and allocating resources to ensure a successful event.

- (a) Organising
- (b) Staffing
- (c) Planning
- (d) Directing

Ans :

COMP 2015

- (c) Planning

Planning is the foundational function where goals, strategies, and resource allocation are established. This step is critical to guide subsequent functions like organizing, staffing, directing, and controlling, ensuring the overall success of the event.

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- 81.** The committee responsible for handling on-site logistics, security, and operations during the event is known as the _____ committee.

(a) Pre-event
(b) During-event
(c) Post-event
(d) Risk Management

Ans :

DELHI 2019

(b) During-event

The during-event committee manages real-time operations, including logistics and security, ensuring that the event runs smoothly. Their role is vital for addressing any immediate issues that arise during the event.

- 82.** In knockout tournaments, a _____ allows a team to advance to the next round without playing in the initial round.

(a) Seeding
(b) Bracket
(c) Bye
(d) Draw

Ans :

OD 2014

(c) Bye

A bye is awarded when the number of teams is uneven, allowing one or more teams to skip the first round. This method maintains a balanced tournament bracket by automatically advancing those teams to the next round.

- 83.** In league tournaments, the _____ method arranges fixtures in a rotating order, ensuring each team competes with various opponents.

(a) Knockout
(b) Cyclic
(c) Combination
(d) Seeding

Ans :

FOREIGN 2016

(b) Cyclic

The cyclic (or staircase) method organizes league fixtures by rotating matchups in a systematic sequence. This approach ensures that every team faces different opponents, promoting fairness and balanced competition throughout the tournament.

- 84.** Community sports programs like Sports Day, Health Run, and Run for Unity are organized to promote _____ and improve public health.

(a) Financial gains
(b) Entertainment

(c) Social interaction
(d) Professional competition

Ans :

SQP 2018

(c) Social interaction

These community events aim to foster social interaction and unity among participants. By encouraging public involvement in physical activities, they enhance community bonding and improve public health, rather than focusing solely on competition or profit.

- 85.** Which function of sports events management involves monitoring performance and making adjustments as needed?

(a) Planning
(b) Directing
(c) Controlling
(d) Staffing

Ans :

COMP 2020

(c) Controlling

Controlling in sports events management involves monitoring performance against established objectives, identifying deviations, and implementing corrective measures. This ensures that the event proceeds as planned, resources are optimally utilized, and any issues are resolved promptly for successful execution efficiently.

- 86.** Which committee is primarily responsible for reviewing the event's success and gathering feedback afterward?

(a) Pre-event Committee
(b) During-event Committee
(c) Post-event Committee
(d) Risk Management Committee

Ans :

DELHI 2017

(c) Post-event Committee

The Post-event Committee reviews the event's overall performance by gathering feedback, analyzing outcomes, and evaluating financial and logistical performance. This review process is critical for identifying improvements, learning from experiences, and planning future events with enhanced strategies in place.

- 87.** Which fixture method in league tournaments presents match schedules in a clear table format?

(a) Knockout Method
(b) Seeding Method
(c) Tabular Method
(d) Combination Method

Ans :

OD 2009

(c) Tabular Method

The Tabular Method organizes match schedules in a clear, structured table that lists dates, venues, and opponents. This method simplifies planning for organizers and provides participants with an easy-to-read format, ensuring that all fixture details are readily accessible and comprehensible.

88. In knockout tournaments, a _____ allows a team to advance to the next round without competing in the initial round.

(a) Seeding
(b) Draw
(c) Bye
(d) Bracket

Ans :

FOREIGN 2006

(c) Bye

A bye in knockout tournaments enables a team to advance without playing a match in the initial round. This mechanism is used when team numbers are uneven, ensuring the bracket remains balanced and that the competition structure is maintained fairly throughout the tournament.

89. Intramural tournaments are typically conducted within:
- (a) Different institutions
(b) A community
(c) A single institution
(d) Professional clubs

Ans :

SQP 2001

(c) A single institution

Intramural tournaments are organized within a single institution such as a school or college. They focus on fostering participation and community spirit among members, with a friendly competitive environment that emphasizes involvement rather than high-stakes, inter-institutional rivalry.

90. Extramural tournaments involve competitions between:
- (a) Teams from a single institution
(b) Professional clubs
(c) Different institutions
(d) Individual athletes only

Ans :

COMP 2004

(c) Different institutions

Extramural tournaments involve teams representing different institutions. This inter-institutional competition increases the level of rivalry and competitive intensity, as teams face

unfamiliar opponents, which often results in a higher standard of play and more dynamic competitive experiences overall.

91. Which community sports program is specifically organized to raise funds and awareness for a charitable cause?
- (a) Sports Day
(b) Health Run
(c) Run for Fun
(d) Run for Specific Cause

Ans :

DELHI 2007

(d) Run for Specific Cause

Run for Specific Cause events are organized with the primary goal of raising funds and awareness for a charitable purpose. These events mobilize community participation while addressing important social issues, thus combining physical activity with meaningful contributions to various causes effectively.

92. Which function of sports events management is primarily concerned with guiding and motivating team members during the event?
- (a) Staffing
(b) Organising
(c) Directing
(d) Controlling

Ans :

OD 2003

(c) Directing

Directing in sports events management involves guiding, motivating, and communicating with team members during the event. This leadership function ensures that tasks are executed efficiently, the team remains focused, and all activities are coordinated effectively for a successful event outcome.

93. The cyclic (staircase) method in league scheduling organizes fixtures by rotating teams in a fixed sequence. This method ensures each team faces various opponents, _____.
- (a) thus ensuring equitable play
(b) by eliminating weaker teams
(c) so that only top teams win
(d) by randomizing all matches

Ans :

FOREIGN 2008

(a) thus ensuring equitable play

The cyclic method systematically rotates team matchups so that every team competes against various opponents. This organized rotation promotes fairness and balanced competition. It

ensures that the schedule is equitable, giving all teams a similar level of challenge throughout the tournament season.

- 94.** Which function of sports events management focuses on recruiting and assigning the right individuals for different roles?

- Planning
- Staffing
- Directing
- Controlling

Ans :

SQP 2006

- Staffing

Staffing involves the process of recruiting, hiring, and assigning personnel to appropriate roles within an event. This function is crucial as it ensures that all tasks are performed by qualified individuals, thereby contributing to the efficient execution and overall success of the sports event efficiently.

TWO MARKS QUESTIONS

- 95.** Briefly explain the functions of Directing and Controlling to organise sports event.

Ans :

SQP 2023

Directing helps to ensure that the individuals and teams involved in the event are aligned and working effectively towards a common goal, while controlling helps to ensure that the event is organised efficiently and effectively by monitoring progress, identifying and addressing issues and making necessary adjustments.

- 96.** What do you understand by planning in sports?

Ans :

AI 2019

It is a cognitive process that involves anticipating and determining goals in advance, along with formulating strategies necessary to achieve them effectively in the realm of sports.

- 97.** Briefly explain the functions of Directing and Controlling to organise sports event.

Ans :

COMP 2023

Directing ensures that individuals and teams participating in the event are coordinated and working efficiently toward a shared objective. Meanwhile, controlling ensures the event is

well-organized by tracking progress, identifying and resolving issues, and making necessary adjustments for optimal effectiveness.

- 98.** Give two objectives of extramural activities.

Ans :

AI-2019

- Enhancing the quality and standards of sports.
- Offering students a valuable and enriching experience.
- Expanding the reach and participation in sports.
- Providing knowledge of updated rules and advanced techniques.

- 99.** Write any two advantages and two disadvantages of league tournament.

Ans :

2021 C

- Advantages of a League Tournament:
 - Every team gets ample opportunities to showcase their skills.
 - Higher revenue generation from advertisements due to a greater number of matches.
- Disadvantages of a League Tournament:
 - Requires more time for completion.
 - Higher organizational costs make it more expensive to conduct.

- 100.** How many total number of matches will be played in a knock-out tournament of 20 teams?

Ans :

2019 C

Total number of matches = $N - 1$

$$= 20 - 1 = 19 \text{ matches}$$

- 101.** Suggest any two disadvantages of league tournament.

Ans :

Delhi 2019

Disadvantages of a League Tournament:

- Time-Consuming :** The tournament takes longer to complete due to multiple matches between teams.
- High Costs :** Organizing a league tournament is more expensive as it requires more resources, facilities, and logistics.

- 102.** Round Robin tournament is of two types. Name them and give one major difference between them.

Ans :

AI 2017

In a Round Robin or League Tournament, all

participating teams compete against one another. This format can be categorized into:

1. Single League : Each team plays against every other team once in the tournament.
2. Double League : Each team competes against every other team twice, providing more opportunities for competition and performance evaluation.

103. What are the advantages of league tournament?

Ans : 2019 C

1. Fair Opportunity for Teams : Every team gets ample chances to showcase their skills, as they play multiple matches.
2. Higher Revenue Generation : With a greater number of matches, there is increased potential for sponsorships, advertisements, and ticket sales, leading to higher revenue.

104. What do you mean by 'Fixture'?

Ans : DELHI 2018

The organised method in which teams participate in any tournament is a fixture. It means arranging the matches in a tournament with details of venue, date and time.

105. What do you mean by 'Seeding'?

Ans : OD 2018, 2016

Seeding is a method used in tournament fixtures to strategically place strong teams or players in appropriate positions, ensuring they do not compete against each other in the early rounds. The organizer must have a thorough understanding of the previous performances of the selected teams or players to implement this method effectively.

106. Fixtures are the schedule, fixed for the matches. What is a Bye?

Ans : Delhi 2017

A bye is the automatic advancement of a competitor to the next round of a tournament without competing in a match due to the absence of an assigned opponent. In other words, it occurs when a team does not have a competitor to face, allowing them to progress without playing while still receiving the winner's points.

107. List any two functions of sports events management and briefly explain the importance of Planning.

Ans : FOREIGN 2002

Functions of sports event management :

1. Planning
2. Organising

Importance of Planning: This function involves setting clear objectives, establishing a timeline, creating a detailed budget, and forecasting the resources needed. Effective planning is crucial because it provides a structured roadmap that guides all subsequent actions, reduces uncertainties, and helps align the efforts of the team to meet the event's goals.

108. Identify one key responsibility of the Pre-Event Committee.

Ans : SQP 2015

One key responsibility of the Pre-Event Committee is logistical arrangements and resource allocation. This involves selecting a suitable venue, arranging necessary equipment, and coordinating initial marketing and communications. Such preparation is critical to ensure that the event runs smoothly from the outset and that all stakeholders are well informed and prepared(D).

109. Explain the difference between a Bye and Seeding in KnockOut tournaments.

Ans : COMP 2019

1. Bye: A bye allows a team or player to automatically progress to the next round without playing a match. This is often used when the number of participants is not a power of two, ensuring a balanced bracket.
2. Seeding: Seeding is the process of ranking teams or players based on past performances or rankings. This ensures that the strongest competitors do not face each other in the early rounds, promoting fairness and a more engaging tournament structure.

110. Define an Intramural Tournament and mention one objective of organizing such events.

Ans : DELHI 2019

1. Definition: An intramural tournament is an internal competition held within a single institution, such as a school or company, where teams from different departments or groups compete against one another.
2. Objective: One primary objective is to foster a sense of community and enhance internal relationships by encouraging participation and teamwork among members in a friendly, competitive setting.

- 111.** What is a Community Sports Program? List two examples.

Ans :

OD 2014

Community sports program is an organized event or series of events aimed at promoting physical activity, encouraging community involvement, and building social cohesion among local residents.

Examples:

1. Sports Day: A day-long event featuring various sports and recreational activities designed to engage community members of all ages.
2. Run for Unity: A running event organized to bring together community members from diverse backgrounds, highlighting themes of social harmony and collective participation.

- 112.** Outline the five key functions of sports events management.

Ans :

FOREIGN 2016

Five key functions of sports event management are :

1. Planning: Setting clear objectives, establishing schedules, and budgeting effectively.
2. Organising: Structuring resources, assigning responsibilities, and coordinating tasks.
3. Staffing: Recruiting, training, and deploying the right personnel to cover all roles.
4. Directing: Leading and motivating the team to follow the event plan, ensuring active engagement.
5. Controlling: Monitoring the event's progress, assessing performance, and implementing corrective measures when necessary.

- 113.** Identify two responsibilities of the During-Event Committee.

Ans :

SQP 2018

Two responsibilities of the During-Event Committee are :

1. Live Coordination: The During-Event Committee ensures that all planned activities, matches, and ceremonies are executed smoothly in real time.
2. Issue Resolution: They also manage any unforeseen problems, address safety concerns, and maintain effective communication among all parties, thereby ensuring a seamless experience for participants and spectators.

- 114.** Describe the Tabular Method used in League tournaments.

Ans :

COMP 2020

The tabular method involves organizing teams into a league table where each team competes against every other team in a round-robin format. Procedure : Results from each match are recorded in the table, which tracks points, wins, draws, and losses. This method provides a clear and systematic way to determine rankings and standings over the course of the tournament, ensuring transparency and fairness.

- 115.** Define an Extramural Tournament and state one significance.

Ans :

DELHI 2017

An extramural tournament is a competitive event that involves teams or individuals from different institutions or organizations.

Significance: Such tournaments enhance competitive spirit and foster networking, as they allow participants to benchmark their performance against teams from other organizations, ultimately contributing to broader exposure and experience.

- 116.** List one objective of Community Sports Programs and explain how it is achieved

Ans :

OD 2009

Objective: To foster community engagement and promote healthy lifestyles.

This is achieved by organizing inclusive events like health runs and sports days, which encourage community members to come together, engage in physical activity, and interact socially, thereby strengthening community bonds and promoting overall well-being.

- 117.** Explain the role of Staffing in sports events management.

Ans :

FOREIGN 2006

1. Role: Staffing is the process of recruiting, training, and assigning the right individuals to various roles within the event.
2. Importance: Effective staffing is crucial as it ensures that every aspect of the event, from planning to execution, is managed by qualified personnel. This leads to efficient operations, better problem-solving during the event, and overall higher quality of management.

- 118.** What are the responsibilities of the Post-Event Committee? Name any two.

Ans :

SQP 2001

Responsibilities of the Post-Event Committee are:

1. **Evaluation and Feedback:** This committee is responsible for conducting a thorough analysis of the event, gathering feedback from participants and stakeholders, and identifying areas for improvement for future events.
2. **Financial Reconciliation:** They handle the final settlement of accounts, ensuring all expenses and revenues are accurately reported and that the event remains financially transparent and accountable.

- 119.** Compare a KnockOut tournament with a Combination tournament in terms of structure.

Ans :

COMP 2004

1. **KnockOut Tournament:** In this format, teams or players are eliminated after a single loss, leading to a rapid reduction in the number of competitors.
2. **Combination Tournament:** This format integrates elements of both league and knockout systems. Initially, teams may compete in a round-robin stage to qualify, followed by knockout rounds, offering teams more opportunities to play and demonstrating consistent performance before elimination.

- 120.** What is the significance of Intramural tournaments? List one primary objective.

Ans :

DELHI 2007

1. **Significance:** Intramural tournaments play a vital role in building internal community spirit by fostering friendly competition among members of the same institution or organization.
2. **Objective:** The primary objective is to encourage participation and improve interpersonal relationships, thereby creating a more collaborative and supportive environment within the institution.

- 121.** Discuss the role of sports events in community development with an example of a community sports program.

Ans :

OD 2003

Role in Community Development: Sports events serve as platforms for promoting physical fitness, social interaction, and unity among community members. They help break down social barriers and build a sense of belonging.

Example : A “Run for Unity” event brings together individuals from diverse backgrounds,

encouraging them to work towards a common goal. This not only promotes physical health but also strengthens community ties and enhances mutual respect among participants.

- 122.** Describe the functions of Directing and Controlling in sports event management.

Ans :

FOREIGN 2008

1. **Directing:** Directing involves leading and motivating the team by providing clear instructions and support throughout the event. It ensures that every team member understands their role and works cohesively towards achieving the event's objectives.
2. **Controlling:** Controlling is the continuous process of monitoring the event's progress, comparing actual performance with the planned objectives, and making necessary adjustments. This function is essential for maintaining quality standards and ensuring that the event runs according to schedule and budget.

- 123.** List two responsibilities of the Pre-Event Committee.

Ans :

SQP 2006

Two responsibilities of the Pre-Event Committee:

1. **Venue and Logistics Arrangement :** The committee is tasked with securing an appropriate venue, ensuring that all facilities are ready, and arranging for necessary equipment and supplies.
2. **Marketing and Publicity :** They also plan and execute promotional activities to attract participants and spectators, including engaging with media outlets and utilizing digital platforms to create awareness about the event.

- 124.** Explain the Cyclic Method in league tournaments and its procedure.

Ans :

COMP 2002

The cyclic method is a scheduling technique where teams play against each other in a fixed rotational order, ensuring that all teams face every other team over the course of the tournament.

Procedure : Matches are arranged in cycles, often balancing home and away games to ensure fairness. Each cycle provides a systematic way to rotate opponents, which helps in maintaining an organized structure and equal opportunity for all teams to compete under similar conditions.

- 125.** What is the role of community sports programs in promoting unity? Explain with one example.

Ans :

DELHI 2010

1. Role: Community sports programs play an essential role in bringing people together from various backgrounds by providing a common platform for interaction. They promote social inclusion, build mutual respect, and help overcome cultural and social barriers through collective participation.
2. Example: A "Run for Specific Cause" event not only encourages physical activity but also unites participants around a shared social or charitable objective. This common goal fosters community spirit and creates opportunities for dialogue and cooperation among diverse groups.

THREE MARKS QUESTIONS

- 126.** Explain the responsibilities of any two committees during sports competition.

Ans :

2024

Responsibilities of committees during sports competition are:

1. First Aid Committee: This committee is headed by a qualified doctor preferably having an experience of sports medicine. The committee provides first aid to the injured or affected athletes during the sporting events and even during practice sessions.
2. Announcement Committee: This committee is responsible for making the different announcements during the progress of the sports meet. It can also inform officials where and when they are needed. It gives information regarding the opening and closing ceremonies, and the progress of the events that are going on as a running commentary.

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- 127.** Write three differences between Intramurals and Extramurals.

Ans :

Delhi 2017

Intramurals	Extramurals
These are sporting activities or tournaments performed within a campus of an institution.	Sporting activities which are performed outside the walls of an institution or school, are known as "extramural".
All the activities are organized for the participants of the institution and outside participants are not allowed to take part. Its motto can be described as "a game for all and each for a game".	In this kind of tournaments teams are from different schools. This can also be called "Inter-school competition."
This is important for physical, mental and social development of students. Stress is laid on participation, entertainment and development of moral and ethical values.	Provide schools to show their sporting caliber. These are important for raising the standards of sports. Provides opportunities to learn new methods and techniques.

- 128.** Write briefly about the objectives of intramurals.

Ans :

Delhi 2016 C

Objectives of Intramural Competitions

1. Encouraging Participation & Leadership: Provides opportunities for every student to engage in sports, fostering leadership qualities.
2. Promoting Teamwork & Sportsmanship : Develops cooperation, teamwork, and a spirit of sportsmanship while offering healthy recreation for growing children.
3. Enhancing Skills & Practical Learning : Allows students to learn various games, develop playing skills, and gain real-life experience in organization and volunteering.

- 129.** Specify the purpose and significance of intramural and extramural tournaments. Explain how these tournaments contribute to community development and sports culture.

Ans :

OD 2012

Intramural tournaments are organized within a single institution (such as a school, college, or community center) to encourage active

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participation, build team spirit, and foster healthy competition among peers. They are significant because they create a safe and inclusive environment for skill development and personal growth. Extramural tournaments, on the other hand, bring together teams or individuals from various institutions or communities. Their significance lies in:

1. **Enhancing Participation:** They provide a platform for athletes of varying skill levels to compete and learn.
2. **Community Building:** These tournaments help forge new social connections, promote cultural exchanges, and strengthen communal ties.
3. **Talent Identification:** They serve as a scouting ground for emerging talent, providing exposure and opportunities to excel at higher levels.
4. **Promoting a Sports Culture:** Both formats encourage regular physical activity and instill values such as teamwork, fair play, and discipline, ultimately contributing to a robust sports culture within the community.

- 130.** Describe the key functions of sports event management with a focus on planning and organising.

Ans :

FOREIGN 2005

Sports event management involves several core functions that work together to ensure a successful event.

1. **Planning :** This is the foundation of any event. It involves setting clear objectives, creating detailed schedules, establishing budgets, and forecasting resource needs. Effective planning anticipates potential challenges and includes contingency plans, ensuring that every aspect—from venue selection to sponsorship acquisition—is well thought out.
2. **Organising :** This function involves structuring the event by defining roles, allocating resources, and setting up communication channels among team members. It ensures that every task is assigned appropriately, and all logistical arrangements such as equipment, transportation, and security are in place. Together, planning and organising create a seamless framework that supports the overall success of the event.

- 131.** Discuss the roles and responsibilities of various committees involved in sports events management during the pre-event, during-event, and post-event phases.

Ans :

SQP 2011

Effective sports event management is achieved through the collaboration of various committees, each with distinct roles across different event phases:

1. **Pre-Event Phase:**
 - i. **Planning Committee:** Responsible for conceptualizing the event, setting goals, drafting timelines, and preparing budgets.
 - ii. **Logistics Committee:** Arranges all physical needs including venue booking, equipment procurement, transportation, and accommodation if necessary.
 - iii. **Marketing and PR Committee:** Develops promotional strategies, creates advertising materials, and handles pre-event publicity to maximize attendance and sponsorship interest.
2. **During-Event Phase:**
 - i. **Operations Committee:** Manages the day-to-day activities of the event, ensuring schedules are followed and resolving any issues that arise immediately.
 - ii. **Technical Committee:** Oversees technical aspects such as equipment functionality, scoring systems, and audiovisual needs to ensure the event runs smoothly.
 - iii. **Safety and Security Committee:** Ensures that all safety protocols are in place, manages crowd control, and prepares for any emergency situations.
3. **Post-Event Phase:**
 - i. **Evaluation Committee:** Conducts a thorough review of the event, gathers feedback from participants and stakeholders, and prepares a detailed report on successes and areas for improvement.
 - ii. **Finance Committee:** Finalizes accounts, audits all expenditures, and ensures that the financial aspect of the event is transparent and accountable.
 - iii. **Public Relations Committee:** Handles post-event communications, releases success stories, and thanks sponsors and participants, helping to maintain a positive image for future events.

- 132.** (a) Differentiate between “bye” and “seeding” in knockout tournament fixtures.
 (b) Explain the significance of these procedures.

Ans :

COMP 2013

- (a) (i) Bye: A “bye” is essentially a free pass given to a team or player when the number of competitors in a knockout tournament is not a power of two. It allows that team to automatically advance to the next round without playing a match in the initial round.
 (ii) Seeding : Seeding involves ranking teams or players based on their previous performance or ability, and then arranging the draw in such a way that the highest-seeded teams are kept apart in the early rounds. This process is designed to prevent strong teams from facing each other too early in the competition.
 (b) Significance:
 (i) Bye: Ensures that the tournament structure remains intact by compensating for uneven numbers, and it prevents early elimination of strong teams simply because of a numerical imbalance.
 (ii) Seeding: Maintains competitive balance throughout the tournament by ensuring that the best competitors are more likely to meet in later rounds, which in turn increases the quality of matches in the final stages and maintains spectator interest.

- 133.** Using an example from a combination tournament, illustrate the procedure for organizing fixtures that incorporate both knockout and league formats.

Ans :

DELHI 2018

Consider a regional football tournament organized as a combination event.

1. League Stage: Teams are first divided into groups and play against every other team within the group using a round-robin format (which may be organized using tabular or cyclic methods). This stage allows each team to accumulate points and demonstrates overall performance.
2. Knockout Stage: The top teams from each group are then seeded according to their league standings and enter a knockout bracket. In this phase, teams face elimination, with procedures such as awarding byes if

necessary.

This hybrid format combines the fairness of a league (where every team gets multiple games) with the excitement and high stakes of knockout rounds, ensuring both comprehensive competition and dramatic conclusions.

- 134.** (a) How does effective staffing contribute to the management of sporting events?
 (b) Explain the role of directing in enhancing event performance.

Ans :

OD 2020

- (a) Staffing : Effective staffing involves recruiting, training, and assigning personnel with the necessary expertise to various roles within the event. This process is critical as it ensures that each aspect of the event—from logistics and security to technical support—is handled by capable individuals. Adequate staffing minimizes the risk of operational breakdowns, improves communication, and enhances overall efficiency during the event.
 (b) Directing : Directing is the act of guiding and motivating the team during the event. It involves providing clear instructions, making quick decisions in response to unforeseen challenges, and ensuring that all team members understand their roles. Effective directing fosters a positive work environment, encourages teamwork, and enables rapid problem-solving, all of which are essential for the smooth execution of the event and for achieving set objectives.

- 135.** Define community sports programs such as “Sports Day,” “Health Run,” “Run for Fun,” “Run for Specific Cause,” and “Run for Unity.” Discuss their primary objectives.

Ans :

FOREIGN 2021

Community sports programs are events organized to promote physical fitness, social interaction, and community spirit.

1. Sports Day: Typically hosted in schools or local communities, it focuses on fostering teamwork, encouraging participation across age groups, and promoting overall health through friendly competition.
2. Health Run: Aimed at raising awareness about health issues, this event encourages individuals to engage in regular physical activity while also disseminating important health information.

3. **Run for Fun:** Organized primarily for enjoyment and recreational purposes, it emphasizes the joy of running and physical activity without competitive pressure.
4. **Run for Specific Cause:** These events are dedicated to raising funds or awareness for a particular social or medical issue, linking physical activity with charitable efforts.
5. **Run for Unity:** Focused on bringing together diverse groups, this event highlights the unifying power of sports by promoting inclusivity and community cohesion.

The primary objectives of these programs are to enhance public health, build stronger communities, raise awareness for important causes, and encourage lifelong participation in physical activities.

- 136.** Explain the functions of sports event management by detailing the roles of controlling and directing in ensuring event success.

Ans :

SQP 2017

In sports event management, controlling and directing are critical functions that ensure the event remains on track and meets its objectives.

1. **Controlling :** This function involves constant monitoring of the event's progress relative to the planned schedule, budget, and quality standards. By comparing actual performance with predetermined goals, the controlling function enables organizers to identify deviations early and take corrective actions, such as reallocating resources or adjusting timelines. This ongoing oversight is vital for managing unforeseen challenges and ensuring a smooth event execution.
2. **Directing :** Directing focuses on leadership and decision-making during the event. It involves issuing clear instructions, motivating the team, and ensuring that all operational aspects are executed according to plan. Effective directing not only resolves issues in real time but also ensures that every team member is working cohesively towards the common goal. The combined efforts of controlling and directing result in a well-managed event that meets its quality, financial, and operational benchmarks.

- 137.** Discuss the responsibilities of the pre-event committee in a sports event. Include aspects such as planning, budgeting, and resource allocation.

Ans :

COMP 2009

The pre-event committee plays a pivotal role in laying the groundwork for a successful sports event. Their responsibilities include:

1. **Planning:** Developing a comprehensive plan that outlines the event objectives, timeline, and detailed activities. This involves brainstorming potential challenges and devising contingency plans to mitigate risks.
2. **Budgeting:** Creating a realistic and detailed budget that covers all necessary expenditures—from venue rental and equipment to marketing and staffing. Accurate budgeting ensures financial stability and aids in acquiring sponsorships.
3. **Resource Allocation:** Determining the types and quantities of resources required, including human resources, technology, and physical infrastructure. This step involves scheduling and ensuring that every department receives adequate support to perform their tasks efficiently.

By focusing on these areas, the pre-event committee ensures that the event is well-prepared, financially viable, and equipped with all necessary resources, thereby setting a solid foundation for success.

- (a) Compare the staircase and cyclic methods used in arranging fixtures in league tournaments.
- (b) What advantages does each method offer?

Ans :

DELHI 2006

- (a) (i) **Staircase Method :** In the staircase method, teams are arranged in a sequential order where each team plays against the team immediately following it, much like stepping through a staircase. This method creates a clear and predictable sequence of matches.
- (ii) **Cyclic Method :** The cyclic method rotates teams in a fixed, repeating order, ensuring that over the course of the tournament, every team plays against each other in a systematic cycle. This rotation is carefully designed to balance the schedule for all participants.
- (b) **Advantages :**
 - (i) **Staircase Method:** Offers simplicity in scheduling, making it easier to manage fixtures and track progress. It provides a clear framework where match pairings follow a logical, linear order, which is particularly useful in smaller leagues.

- (ii) **Cyclic Method:** Promotes fairness by ensuring an even distribution of matchups, including balanced home and away games when applicable. It minimizes scheduling biases and guarantees that each team faces every opponent under similar conditions, contributing to a more competitive league environment.

- 139.** (a) How does effective organising contribute to the overall management of a sports event?
 (b) Discuss how the staffing process can affect event performance.

Ans :

OD 2001

- (a) **Organising :** Effective organising involves establishing clear structures and processes before the event begins. This includes defining roles, setting up communication channels, coordinating logistics, and preparing detailed schedules. When every element is organised, it reduces confusion, prevents overlapping responsibilities, and ensures that all resources are optimally utilized. A well-organised event is more likely to proceed seamlessly, even in the face of unexpected challenges.
- (b) **Staffing :** The staffing process is critical because it determines the quality and efficiency of the event execution. By recruiting skilled personnel and volunteers, assigning tasks according to expertise, and ensuring that everyone understands their responsibilities, the event management team can operate smoothly. Effective staffing boosts morale, enhances problem-solving capabilities, and improves overall performance. Conversely, poor staffing can lead to miscommunication, delays, and operational inefficiencies that can detract from the event experience.

- 140.** What are the key responsibilities of the marketing and public relations committees during the pre-event and post-event phases?

Ans :

FOREIGN 2004

The marketing and public relations (PR) committees are essential for building excitement and maintaining the image of the event both before and after it occurs.

1. **Pre-Event Phase : Marketing Committee:** Develops and implements promotional strategies, designs advertising materials, and conducts outreach through social media and traditional channels. Their work ensures that

potential participants and sponsors are aware of the event and its benefits.

2. **Public Relations Committee :** Focuses on creating positive media relations, drafting press releases, and coordinating with influencers to create a buzz. Their goal is to convey the event's values, objectives, and anticipated impact effectively.
3. **Post-Event Phase : Marketing Committee:** Analyzes the effectiveness of their campaigns, collects data on audience engagement, and prepares reports for future improvement.
4. **Public Relations Committee :** Manages follow-up communications, shares success stories, and addresses any negative feedback to safeguard the event's reputation.

Both committees work together to ensure that the event is well-received, gains widespread recognition, and lays the groundwork for future initiatives.

- 141.** Discuss the role of planning and controlling in sports event management, giving specific examples of how each function can mitigate risks during an event.

Ans :

SQP 2007

In sports event management, planning and controlling are interrelated functions that significantly reduce risks and ensure smooth execution.

1. **Planning :** This stage involves anticipating potential challenges such as adverse weather conditions, equipment failures, or logistical bottlenecks. For example, if an outdoor event is scheduled, the planning committee might secure an alternative indoor venue or schedule buffer periods to account for delays. Detailed planning also includes creating emergency response protocols, ensuring that every potential risk has a mitigation strategy in place.
2. **Controlling :** During the event, the controlling function continuously monitors key performance indicators—attendance, budget adherence, and on-site operations. For instance, if there is an unexpected crowd surge, the controlling team can immediately implement safety measures, such as additional crowd control personnel or temporary barricades. This real-time adjustment ensures that the event remains within the planned parameters and that any issues are swiftly addressed before they escalate.

- 142.** Describe the responsibilities of the operations and technical committees during the event phase of a sporting event.

Ans :

COMP 2003

During the event phase, the operations and technical committees are crucial in ensuring that every element runs smoothly and efficiently.

1. Operations Committee
 - i. Oversees the entire event execution by ensuring that the schedule is followed and that every logistical component is functioning as planned.
 - ii. Manages on-site operations, including venue setup, transportation, crowd management, and emergency response protocols.
 - iii. Coordinates between different committees to resolve any operational issues promptly and effectively, ensuring that the event maintains a steady flow.
2. Technical Committee:
 - i. Responsible for the setup and maintenance of all technical systems, such as scoreboards, sound systems, lighting, and communication networks.
 - ii. Ensures that technological aspects are tested and operational before the event begins, reducing the risk of disruptions during critical moments.
 - iii. Provides on-site technical support to quickly troubleshoot and fix any issues that arise during the event.

Together, these committees ensure that the physical and technical infrastructure of the event supports a smooth and enjoyable experience for both participants and spectators.

- 143.** (a) Explain the “tabular method” for fixture arrangements in league tournaments.
 (b) How does this method ensure fairness among teams?

Ans :

DELHI 2008

- (a) **Tabular Method :** The tabular method involves organizing the fixture schedule in a table format where each row represents a team and each column represents a match day or round. This systematic approach lays out all fixtures clearly, ensuring that each team’s opponents and match times are visible and balanced.
- (b) **Ensuring Fairness :** By using the tabular method, organizers can ensure that each

team plays against every other team an equal number of times, with a balanced distribution of home and away games if applicable. The method minimizes scheduling conflicts and bias, as every team follows a structured and transparent schedule, which helps maintain competitive fairness throughout the tournament.

- 144.** Illustrate with an example how a “Run for Specific Cause” community sports program can be managed successfully through effective planning, organising, and staffing.

Ans :

OD 2006

Consider a “Run for Cancer Awareness” event designed to raise funds and increase public awareness.

1. Planning:
 - i. The organizing committee sets clear goals, such as fundraising targets and awareness milestones.
 - ii. Detailed schedules are created, including route mapping, safety protocols, and contingency plans in case of unexpected weather changes.
 - iii. Budgets are allocated to cover costs such as permits, promotional materials, and medical support.
2. Organising:
 - i. Responsibilities are clearly distributed among various teams: logistics (arranging water stations, first-aid, and route markers), marketing (promotional campaigns, media coverage), and volunteer coordination (managing participant registrations and on-site support).
 - ii. Effective communication channels are established to ensure all teams are synchronized on event day.
 - iii. The event recruits experienced personnel and enthusiastic volunteers, ensuring that each station is manned by someone knowledgeable and prepared for emergencies.
 - iv. Team leaders are appointed to oversee specific aspects of the event, ensuring that every detail is managed professionally.

- 145.** (a) What are the primary challenges in staffing for large-scale sporting events?
 (b) How can effective directing help overcome these challenges during the event?

Ans :

FOREIGN 2002

(a) Primary Challenges in Staffing:

- i. Recruiting and training a large number of personnel on a tight schedule, which can sometimes lead to gaps in expertise.
- ii. Ensuring consistent communication and coordination among diverse teams that may include both professional staff and volunteers.
- iii. Managing varying levels of experience and maintaining high morale, especially under the stress of live event conditions.

(b) Overcoming Challenges with Effective Directing:

- i. Effective directing provides clear, authoritative guidance that helps streamline operations even when staff numbers are high.
- ii. Leaders who practice strong directing skills can quickly disseminate important information, resolve conflicts, and adapt to changing circumstances.
- iii. By motivating the team and ensuring that everyone understands their roles and responsibilities, effective directing creates a cohesive unit capable of handling unforeseen challenges, thus ensuring the event runs smoothly despite staffing complexities.

- 146.** What are the essential functions of sports event management? Explain how the integration of planning, organising, staffing, directing, and controlling ensures a successful event.

Ans :

SQP 2017

The essential functions of sports event management include:

1. **Planning:** Establishes the vision and objectives of the event, develops timelines, budgets, and contingency plans to address potential issues before they arise.
2. **Organising:** Structures the event by defining roles, allocating tasks, and setting up effective communication channels among all participants.
3. **Staffing:** Involves recruiting skilled personnel and volunteers to ensure that each area of the event is managed by individuals with the appropriate expertise.
4. **Directing:** Focuses on leadership, providing clear instructions, motivating the team, and making on-the-spot decisions to address unforeseen challenges.

5. **Controlling:** Monitors the event's progress, compares actual performance with planned outcomes, and implements corrective measures as necessary.

- 147.** Discuss the responsibilities of the post-event committee and its importance in the overall cycle of sports event management.

Ans :

COMP 2009

The post-event committee plays a crucial role in wrapping up the event and providing valuable insights for future planning. Their responsibilities include:

1. **Evaluation:** Conducting a comprehensive review of the event to assess whether the set objectives were met, analyzing both successes and shortcomings.
2. **Feedback Collection:** Gathering detailed feedback from participants, sponsors, and team members through surveys, interviews, and debriefing sessions to inform future improvements.
3. **Financial Closure:** Finalizing all accounts, conducting audits, and ensuring that the financial transactions are transparent and properly documented.
4. **Documentation:** Preparing detailed reports and case studies that document lessons learned, best practices, and recommendations for future events.

This reflective process is vital as it promotes continuous improvement, enhances accountability, and helps build a repository of knowledge that can be used to organize even more successful events in the future.

- 148.** How do fixtures procedures differ between knockout tournaments and league tournaments? Provide examples to support your answer.

Ans :

DELHI 2006

Fixtures procedures differ significantly between knockout and league tournaments due to the structure and objectives of each format.

1. **Knockout Tournaments:**
 - i. Fixtures are arranged in a bracket format where a single loss results in elimination.
 - ii. The use of "byes" is common when the number of teams is not a power of two, and seeding is used to ensure that the strongest teams do not meet in the early rounds.

- iii. For example, in tennis Grand Slams, top seeds are strategically placed in different sections of the draw to ensure competitive fairness in later rounds.
- 2. League Tournaments:
 - i. Fixtures are typically arranged in a round-robin format where every team plays against every other team.
 - ii. Methods such as the staircase, cyclic, or tabular method are used to schedule matches systematically over several rounds.
 - iii. For instance, in a national football league, each team competes in both home and away matches, ensuring that every team faces the others under comparable conditions.

149. (a) Explain the concept of “seeding” in knockout tournaments.

(b) How does seeding impact the competitive balance in such tournaments?

Ans :

OD 2001

- (a) Seeding : Seeding is the process of ranking teams or players based on their historical performance, current form, or other established criteria. This ranking is then used to strategically place them in the tournament bracket. The main goal is to ensure that the best performers are not matched against each other in the early rounds, allowing them to progress further into the competition.
- (b) Impact on Competitive Balance : Seeding ensures that the highest-ranked teams or players are distributed evenly across the draw, thereby minimizing the chances of early eliminations of top contenders. This leads to more balanced and exciting matches in the later stages of the tournament. As a result, spectators are more likely to witness high-quality contests in the final rounds, and the overall competitive integrity of the tournament is maintained.

150. Illustrate with an example how the combination of fixtures procedures (using both knockout and league formats) can cater to diverse competitive objectives in a sports event.

Ans :

FOREIGN 2004

Imagine a regional volleyball championship designed as a combination tournament.

- 1. League Stage : Teams are divided into groups, and within each group, they compete in a round-robin format using the cyclic or tabular method. This stage allows every team to play several matches, accumulating points and demonstrating their overall performance.
- 2. Knockout Stage : The top teams from each group are then seeded based on their performance and enter a single-elimination bracket. Matches in this stage are high stakes, as a single loss results in elimination from the tournament.

By integrating these two formats, the tournament achieves a balance between providing ample competitive exposure for all teams in the league stage and creating an intense, high-pressure environment in the knockout rounds. This structure not only ensures fairness in early rounds but also heightens the excitement and anticipation as the tournament advances to the later stages.

151. (a) How does effective directing within the management team enhance the performance of a sports event?

(b) Discuss the role of self-talk and self-esteem in the leadership of the event management team.

Ans :

SQP 2007

- (a) Effective Directing : Effective directing involves clear communication, decisive leadership, and proactive problem-solving. When leaders are able to articulate their vision, delegate tasks efficiently, and make rapid decisions in response to unforeseen challenges, the entire event team benefits from enhanced coordination and morale. This not only keeps the event on schedule but also ensures that any issues are resolved before they escalate, thus significantly enhancing overall performance.
- (b) Self-Talk and Self-Esteem in Leadership : Positive self-talk and a strong sense of self-esteem are critical for leaders in high-pressure situations. Leaders who maintain a positive inner dialogue are more resilient and confident, which in turn inspires their team. This confidence helps in managing stress, making sound decisions, and motivating staff members. When leaders project confidence and a can-do attitude, it instills trust among the team, leading to improved collaboration and a more successful event outcome.

FIVE MARKS QUESTIONS

- 152.** Explain pre, during and post game responsibilities of officials of various committees for organising a sports tournament smoothly.

Ans :

Term-I, 2021-22 C

Responsibilities of Committees in Sports Events

1. Pre-Game Responsibilities:

- i. **Organizing Committee :** Prepares the budget, identifies funding sources (including sponsorships), and enlists qualified personnel based on the sport. It also forms sub-committees to manage various aspects of the sports meet.
- ii. **Publicity Committee :** Promotes the event to attract participants and spectators by coordinating with the media and using platforms like websites, social media, emails, and physical mail.
- iii. **Equipment and Technical Committee :** Ensures the availability and proper functioning of all necessary sports equipment and technical requirements.

2. Responsibilities During the Event:

- i. **Refreshment and Entertainment Committee :** Manages the distribution of water, refreshments, and meals to participants and guests.
- ii. **First Aid Committee :** Provides immediate medical assistance to injured athletes and ensures medical readiness for emergencies.

3. Responsibilities After the Event:

- i. **Organizing Committee :** Conducts a post-event evaluation to assess the overall success and areas of improvement in the sports meet.
- ii. **First Aid Committee :** Continues to monitor the condition of injured participants and arranges for serious cases to be referred to hospitals for further treatment.

- 153.** Suggest the formation of various committees for systematic and smooth conduct of sports day in your school.

Ans :

AI 2017

1. **Organising Committee :** This committee prepares the overall budget for the sports meet by identifying funding requirements and sources, including sponsorships. They enlist

qualified personnel as needed for various sports and establish sub-committees to handle different aspects of the event.

2. **Publicity Committee :** Tasked with disseminating event information, this committee works to attract participants and spectators. They establish media contacts and use various channels—such as websites, social media, email, and traditional mail—to
3. **Entries and Programme Committee :** This group manages the invitations process, ensuring that all necessary parties (teams, officials, guests, and dignitaries) receive timely invitations. Their goal is to facilitate prompt responses so that everyone can prepare adequately for the event.
4. **Officials' Selection Committee :** A key committee responsible for selecting officials including referees, judges, recorders, clerks, marshals, track umpires, timekeepers, and other essential personnel.
5. **Equipment and Technical Committee :** This team is in charge of identifying and securing suitable facilities and equipment for the event. They ensure that game surfaces are properly marked, cleaned, and free of hazards—whether the event is held indoors or outdoors.
6. **Transportation Committee :** Responsible for organizing efficient and comfortable transportation for participants and officials, this committee arranges travel from their lodging to the event venues.
7. **Boarding and Lodging Committee :** This committee handles accommodation and meal arrangements for participants and officials. They often prepare a brochure detailing hotel facilities, parking, nearby hospitals, first aid services, and local attractions.
8. **Decoration Committee :** Focused on enhancing the event's visual appeal, this team establishes a theme complete with a logo and slogan, and they manage the decoration of the sports arena and the display of banners.
9. **Reception Committee :** This group welcomes guests and directs them to the hospitality volunteers, playing a crucial role during both the opening and closing ceremonies.
10. **Refreshment and Entertainment Committee:** This committee arranges for refreshments, water, and entertainment for participants and special guests. They plan these services well in advance and also coordinate recreational activities during the opening and closing

NODIA

ceremonies.

- 154.** Your school is organising 'Run for Unity', explain the responsibilities of accreditation, technical and finance committee.

Ans :

Delhi 2016

"Run for Unity" is a non-competitive event aimed at fostering peace and harmony among people of various religions and faiths. Its goal is to encourage participation from prominent figures across different segments of society, enhancing the event's popularity. Prizes will be awarded to the top three finishers.

1. **Technical Committee :** This committee is in charge of preparing the running track according to specific guidelines. It ensures that all equipment meets the required standards, is well maintained, and is fully operational. A key responsibility is to ready the ground for various track and field activities, with particular attention to ensuring that the running route is clear of traffic and disruptive crowds. Additionally, the committee will secure any necessary permissions from municipal authorities.
2. **Accreditation Committee :** The Accreditation Committee handles obtaining official recognition for the event from various agencies, thereby lending it quality and prestige. Their efforts aim to elevate the event's status, attracting a larger and more diverse group of participants.
3. **Finance Committee :** Tasked with overseeing the event's financial aspects, this committee focuses on budgeting, financial planning, and securing sponsorships. They also explore additional funding avenues to ensure that the event is organized to the highest standards.

- 155.** League tournament is a better way to judge the best team of the tournament. Comment.

Ans :

COMP 2020

1. Only teams that combine strength, skill, and endurance tend to win the tournament.
2. Every team is given ample opportunity to demonstrate its abilities.
3. Increased publicity for games and sports contributes significantly to their overall popularity.
4. With more chances to observe players, officials are better positioned to identify the best team.

5. Since teams can progress without necessarily defeating every opponent, each team gains valuable experience.
6. There are numerous opportunities for teams to enhance their performance and refine their skills.
7. Spectators have the opportunity to enjoy a greater number of games.
8. The increased number of events can generate higher advertising revenue.

- 156.** What is the meaning of tournament ? Draw knock-out fixture for 27 teams.

Ans :

Delhi 2017

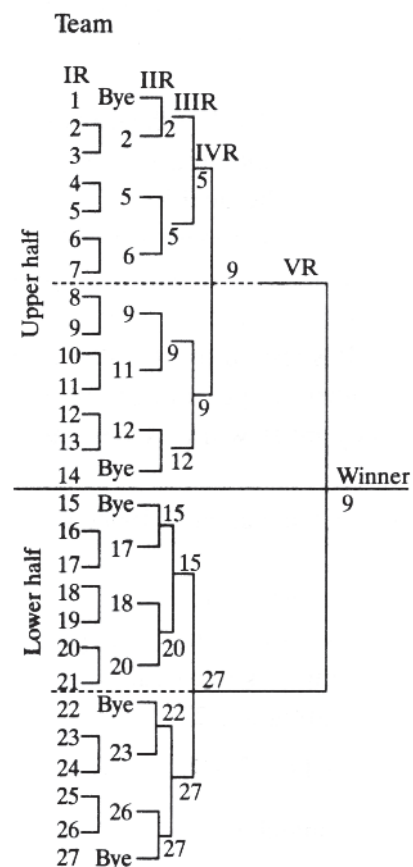
A tournament is a series of contests among multiple competitors, all vying for an overall prize. They are organized at various levels, including zonal, district, state, national, and international events. At the highest level, international tournaments such as the Olympic Games and World Cups stand out. Tournaments hold a vital role in the realm of sports.

Knock-out fixture for 27 teams :

Number of teams = 27

Number of byes = $32 - 27 = 5$ byes

Knock-out Fixture



- 157.** What is a league tournament ? Draw a fixture for six teams using Round Robin method.

Ans :

AI 2017, Delhi 2016

League Tournament : Also known as the “Round Robin Tournament,” this format was first conceptualized by Mr. Johann Berger, which is why it is sometimes referred to as the “Berger System.”

A fixture of 6 teams on league basis according to cyclic method.

Total number of teams = 6

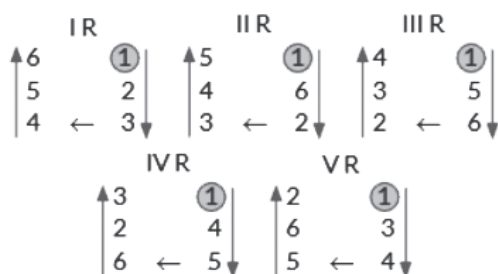
Total number of matches

$$= \frac{N(N-1)}{2} = \frac{6(6-1)}{2}$$

$$= \frac{6(5)}{2} = \frac{30}{2} = 15 \text{ matches}$$

Number of rounds = $N - 1 = 6 - 1 = 5$ rounds

Fixture



- 158.** Draw a fixture of 9 Volleyball teams on league basis following the staircase method.

Ans :

Delhi 2017, 2017 C

Fixture of 9 teams (8 rounds) by stair case method:

1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
1-2							
1-3	2-3						
1-4	2-4	3-4					
1-5	2-5	3-5	4-5				
1-6	2-6	3-6	4-6	5-6			
1-7	2-7	3-7	4-7	5-7	6-7		
1-8	2-8	3-8	4-8	5-8	6-8	7-8	
1-9	2-9	3-9	4-9	5-9	6-9	7-9	8-9

- 159.** On the basis of knock-out tournament, prepare a fixture of 17 teams mentioning all the steps involved.

Ans :

2021 C

Steps for the fixture of knock-out tournament:

- (i) Total number of matches should be calculating by knowing total number of teams.
‘N’ denotes total number of teams.
So, total number of matches = $N - 1 = 17 - 1 = 16$ matches.
- (ii) The total number of teams are not in power of 2.

$$\text{Upper half} = \frac{N+1}{2} = \frac{17+1}{2}$$

$$= \frac{18}{2} = 9 \text{ teams}$$

$$\text{Lower half} = \frac{N-1}{2} = \frac{17-1}{2}$$

$$= \frac{16}{2} = 8 \text{ teams}$$

- (iii) As total number of teams are not in power of ‘2’, so byes will be given.
total number of byes = Difference between next highest power of 2 from total teams and total number of teams.
= $32 - 17 = 15$ byes.
- (iv) Total number of byes in upper half

$$= \frac{15-1}{2} = 7 \text{ byes}$$

Total number of byes in lower half

$$= \frac{15+1}{2} = 8 \text{ byes}$$

- (v) Number of rounds

$$= 2 \times 2 \times 2 \times 2 \times 2 = 5 \text{ rounds.}$$

- (vi) Teams in each quarter.

First Quarter = $4 + 1 = 5$ teams

Second Quarter = 4 teams

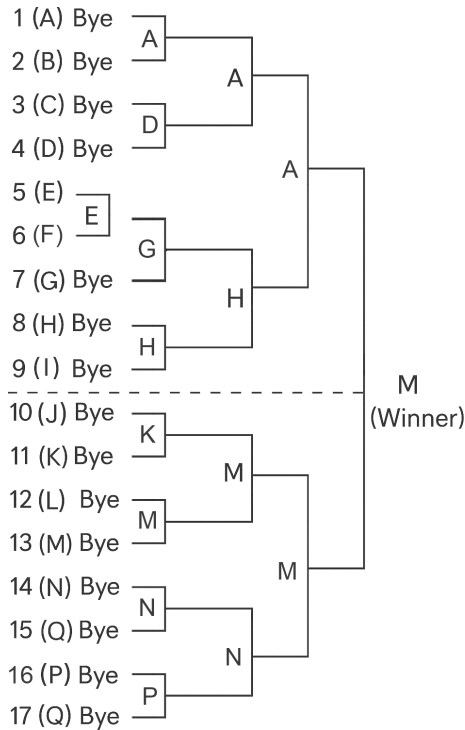
Third Quarter = 4 teams

Fourth Quarter = 4 teams

Fixture:

Ist Round IInd Round IIIrd Round IVth Round Vth Round

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- 160.** Draw a knock out fixture for 25 teams with all steps involved.

Ans :

DELHI 2020

- (i) Total no. of matches = Total no. of teams - 1
= 25 - 1 = 24

- (ii) Total no. of rounds = $2 \times 2 \times 2 \times 2 \times 2$
i.e. Digit 2 report 5 times = 5 rounds

- (iii) Total teams in upper half
= (Total no. of teams + 1) / 2
= 26/2 = 13 teams

Total teams in lower half
= (Total no. of teams - 1) / 2
= 24/2 = 12 teams

- (iv) As the total no. of teams are more than 16, so we have to divide teams also in quarters.

Teams in each quarter: $(25/4 = 6)$

First quarter: 6 + 1 = 7

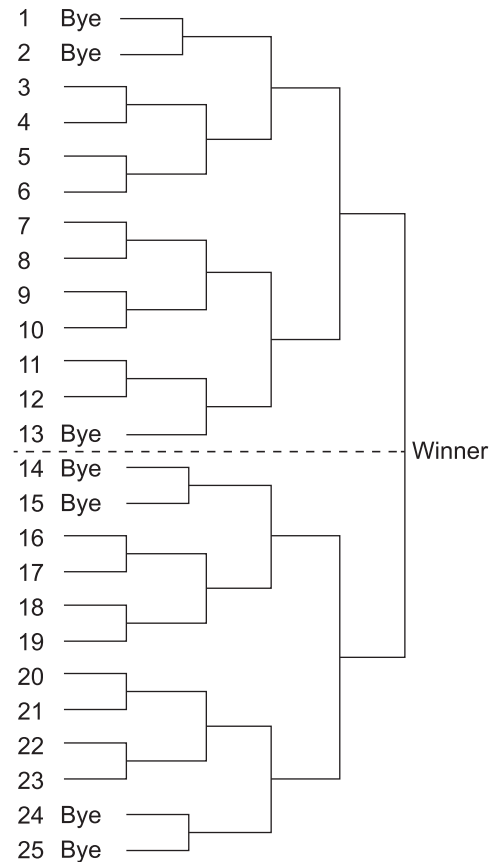
Second quarter: 6

Third quarter: 6

Fourth quarter: 6

- (v) Total no. of byes = 32 - 25 = 7 byes
Byes in upper half = $(B - 1)/2 = 3$ byes
Byes in lower half = $(B + 1)/2 = 4$ byes

Teams I Round II Round III Round IV Round V Round



- 161.** Draw a fixture of 12 teams on a league basis according to the staircase method. How will you decide the winner in a league tournament?

Ans :

Delhi 2019

Fixture of 12 teams according to staircase method.

1-2											
1-3	2-3										
1-4	2-4	3-4									
1-5	2-5	3-5	4-5								
1-6	2-6	3-6	4-6	5-6							
1-7	2-7	3-7	4-7	5-7	6-7						
1-8	2-8	3-8	4-8	5-8	6-8	7-8					
1-9	2-9	3-9	4-9	5-9	6-9	7-9	8-9				
1-10	2-10	3-10	4-10	5-10	6-10	7-10	8-10	9-10			
1-11	2-11	3-11	4-11	5-11	6-11	7-11	8-11	9-11	10-11		
1-12	2-12	3-12	4-12	5-12	6-12	7-12	8-12	9-12	10-12	11-12	

Number of matches to be played

$$\begin{aligned} \text{No. of matches} &= \frac{N(N-1)}{2} = \frac{12(12-1)}{2} \\ &= \frac{12 \times 11}{2} = \frac{132}{2} = 66 \text{ matches} \end{aligned}$$

The following way is used to decide a winner:

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The team that wins the match gets = 2 points
 The team that loses the match gets = 0 point
 If match draws then each team gets = 1 point
 After the tournament, teams receive scores based on their performance, and the team with the highest score is declared the winner. If two teams end up with equal points, an additional match is played between them.

- 162.** What is a league tournament? Draw a fixture of 9 teams on the basis of league tournament by using cyclic method. Explain British method to declare the winner.

Ans :

AI 2019

- (i) League Tournament: In this format, each team plays against every other team. In a single league tournament, each team faces every opponent once, while in a double league tournament, each team plays against every other team twice.
- (ii) Fixture of 9 teams according to cyclic method : Total no. of teams = 9

$$\text{Total no. of matches} = N\left(\frac{N-1}{2}\right) = 9\left(\frac{9-1}{2}\right) = 36$$

Total no. of rounds = 9

I Round	II Round	III Round	IV Round	V Round
9 Bye	8 Bye	7 Bye	6 Bye	5 Bye
8 1	7 9	6 8	5 7	4 6
7 2	6 1	5 9	4 8	3 7
6 3	5 2	4 1	3 9	2 8
5 4	4 3	3 2	2 1	1 9

VI Round	VII Round	VIII Round	IX Round
4 Bye	3 Bye	2 Bye	1 Bye
3 5	2 4	1 3	9 2
2 6	1 5	9 4	8 3
1 7	9 6	8 5	7 4
9 8	8 7	7 6	6 5

British Method : This method calculates a team's performance by dividing the total points earned by the total possible points. For example, if a team plays 8 matches, winning 6 and drawing 2—with wins awarding 2 points and draws 1 point—their total points would be $(6 \times 2) + (2 \times 1)$. This total is then divided by the maximum possible points to determine the percentage.

Total points = $12 + 2 = 14$

Possible points = $8 \times 2 = 16$

Percentage of points

$$= \frac{\text{Total points obtained}}{\text{Total possible points}} \times 100$$

$$= \frac{14}{16} \times 100 = 87.5\%$$

Total possible points = 87.5%

- 163.** Mention all calculations and steps involved to draw a knock-out fixture of 19 teams, where 4 teams are to be seeded(D)

Ans :

OD 2018

Total no. of teams = 19 ($N = 19$)

No. of matches = $(N - 1) = 19 : 1 = 18$

No. of teams in upper half = $\frac{N+1}{2} = 10$

No. of teams in lower half = $\frac{N-1}{2} = 9$

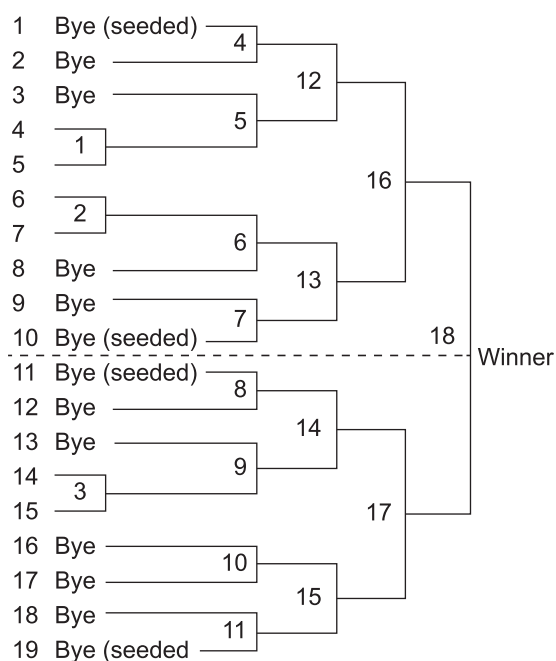
Total no. of byes (NB) = next power of 2 - N
 $= 32 - 19 = 13$

No. of byes in upper half = $\frac{NB-1}{2} = 6$

No. of byes in lower half = $\frac{NB+1}{2} = 7$

Seeding : 2 teams in upper half with byes
 2 teams in lower half with byes.

Teams I Round II Round III Round IV Round V Round



- 164.** Define combination tournament. Draw a fixture of 16 teams using Knock-out cum League Method.

Ans :

FOREIGN 2018

Combination Tournaments : These tournaments employ more than one format during their stages. Typically, the initial rounds are played using one system (such as a knock-out or league format), while the later rounds switch to a different format

(either league or knock-out).

Fixture:

No. of teams = 16

For combination tournament, teams are divided into four equal parts.

$$\text{Group} = \frac{16}{4} = 4$$

Group A (First four teams)

Group B (Second four teams)

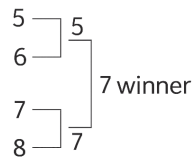
Group C (Third four teams)

Group D (Last four teams)

Round 1, Group A



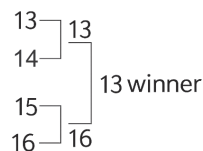
Round 1, Group B



Round 1, Group C



Round 1, Group D



Winner of each team will participate in league tournament.

League Tournament

4, 7, 12, 13

No. of matches for league tournament

$$= \frac{N(N-1)}{2} = \frac{4 \times 3}{2} = \frac{12}{2} = 06$$

Fixture of league tournament by staircase method.

4 – 7		
4 – 12	7 – 12	
4 – 13	7 – 13	12 – 13

or

Cyclic method

I	II	III
4 - 13	4 - 12	4 - 7
7 - 12	13 - 7	12 - 13

165. What should be the role of technical and marketing committee while organising the event?

Ans :

2023-24

1. **Technical Committee :** This committee oversees the technical aspects of sports events, including procuring necessary equipment and ensuring that matches are conducted on time by designated officials such as referees,

umpires, judges, and timekeepers.

i. **Pre-Sports Event/Tournament :** Before the event, the technical committee is responsible for submitting requisitions for purchasing sports equipment, inviting and confirming officials, cleaning and setting up the playing fields, organizing equipment and stationery, preparing fixtures, and establishing rules and regulations for the tournament.

ii. **During Sports Event/Tournament :** While the tournament is ongoing, the committee ensures the smooth execution of matches, monitors the presence of the jury, maintains the cleanliness and layout of the playing fields, collects score sheets and related documents from officials, and compiles the merit list.

iii. **Post-Sports Event/Tournament :** After the event concludes, the committee oversees field cleaning and maintenance, ensures the proper storage of all equipment, and restores the field to its original condition.

2. **Marketing Committee :** The marketing committee is responsible for promoting the event and securing sponsorships. Publicity is managed through various channels such as social media, print media, television, and email. Sponsorships may be acquired in cash or kind by forming partnerships with media outlets, food vendors, beverage companies, and other sponsors. Additionally, the committee organizes promotional campaigns related to the event.

i. **Pre-Sports Event/Tournament:** Before the event, the marketing committee devises strategies to attract sponsors, promotes the event through different media platforms, arranges meetings with potential sponsors, and drafts Memorandums of Understanding (MoUs) for sponsorship agreements.

ii. **During Sports Event/Tournament :** While the event is in progress, the committee handles press releases, collaborates with media representatives, manages communication channels, fulfills sponsor commitments as outlined in MoUs, and arranges for the event's telecast.

iii. **Post-Sports Event/Tournament :** After the event, the committee issues final press releases and may organize a re-telecast

of the tournament to maintain audience engagement.

- 166.** List any four functions of Sports Events Management and explain one function in detail with an example.

Ans :

SQP 2003

Sports Events Management involves a series of interrelated functions that ensure the smooth execution of any sporting event. The key functions include:

1. Planning
2. Organising
3. Staffing
4. Directing
5. Controlling

Planning is the cornerstone of sports event management, setting the stage for all subsequent activities. It begins with defining clear objectives and identifying the target audience, which could range from local community members to international participants. Detailed planning involves setting timelines, budgeting, risk assessments, and determining the necessary resources, such as venues, equipment, and personnel. For instance, when organizing a regional athletics meet, planners must decide on the event's scope, schedule the various competitions, secure the location, and arrange for necessary permits and safety measures. They also outline contingency plans to address unexpected issues like weather disruptions or medical emergencies.

Moreover, planning includes marketing strategies to promote the event, ensuring a robust registration process, and developing partnerships with sponsors. This function establishes communication channels among all stakeholders, from athletes to local authorities. The effectiveness of planning is often reflected in the event's ability to meet its objectives, maintain participant safety, and provide a memorable experience for both competitors and spectators. Overall, thorough planning mitigates risks, minimizes errors, and sets a clear roadmap, which is critical to the success of any sporting event.

- 167.** Discuss the roles and responsibilities of the various committees involved in sports event management during the pre-event, during-event, and post-event phases. Provide examples of tasks for each phase.

Ans :

COMP 2008

In sports event management, specialized committees are established to address distinct phases of the event lifecycle, ensuring that every detail is covered comprehensively.

1. **Pre-Event Phase :** Committees formed during the pre-event phase focus on comprehensive planning and preparation. Their responsibilities include designing the event framework, arranging venues, securing sponsorships, and initiating marketing campaigns. For example, a pre-event marketing committee may develop promotional materials and manage registration portals. Logistics committees work on arrangements such as transportation, accommodation, and equipment procurement. This phase is critical as it lays down the blueprint for the entire event, ensuring that all aspects are covered in advance.
2. **During-Event Phase :** The during-event committees are tasked with the real-time execution of the event. They monitor the schedule, manage on-site operations, coordinate with security and medical teams, and troubleshoot any unexpected issues. For instance, an operations committee ensures that matches or competitions run on time and that communication among various teams is maintained through centralized coordination points. This phase demands flexibility and quick decision-making to address any last-minute challenges that may arise.
3. **Post-Event Phase :** Post-event committees are responsible for evaluation, reporting, and debriefing. They collect feedback from participants, analyze performance data, reconcile finances, and document lessons x For example, a post-event evaluation committee may conduct surveys and organize debrief sessions to understand what worked well and what could be improved in future events. This phase is essential for continuous improvement and building a repository of best practices for future events.

- 168.** Describe the fixture procedures used in sports tournaments by explaining the KnockOut tournament format (including bye and seeding) and one League tournament method (e.g., Tabular method).

Ans :

DELHI 2006

Fixture procedures in sports tournaments are designed to ensure fairness, competitiveness, and

logistical efficiency. Two popular formats include the KnockOut tournament and the League tournament using the Tabular method.

1. **KnockOut Tournament :** This format involves teams or individuals competing in single-elimination matches where the loser is immediately eliminated. When the number of participants is not a power of two, byes are used. A bye is an automatic advancement granted to one or more teams so that all remaining teams have an opponent in the next round. Seeding is another critical aspect where teams are ranked based on their past performance or perceived strength. This method prevents the strongest teams from facing each other in early rounds, thus ensuring a balanced competition. For instance, in a tennis tournament, the highest-ranked players might receive a bye, allowing them to enter in later rounds while lower-ranked players compete initially.
2. **League Tournament : Tabular Method :** In contrast, the league or round-robin format requires each team to play every other team in a pre-determined schedule. Results from each match are recorded in a table, which typically includes columns for wins, losses, draws, and points. This method emphasizes consistency and endurance over a series of games rather than a single elimination, offering a comprehensive evaluation of team performance. For example, in a soccer league, each match result contributes to the overall points tally, with the final standings determined by the total points accumulated over the season. The table may also include goal differences and head-to-head records as tie-breakers. This method ensures that every team competes on an equal footing and provides a detailed record of performance throughout the tournament.

- 169.** Define community sports programs and discuss one type (e.g., Sports Day) in detail, explaining its objectives and benefits.

Ans :

OD 2002

Community sports programs are organized events that aim to promote physical activity, enhance social interaction, and build a sense of community among participants. These programs are often designed to be inclusive, engaging people of all ages and abilities, and typically emphasize recreational and health benefits rather than

intense competition.

Sports Day : A Sports Day is a classic example of a community sports program, often held in schools, community centers, or local parks. The primary objectives of a Sports Day include encouraging regular physical exercise, fostering team spirit, and providing an opportunity for community members to come together in a fun and supportive environment. The event typically features a variety of activities such as track and field events, relay races, and team sports. Participants might include students, teachers, local families, and volunteers, making it a multifaceted event that caters to different interests and age groups.

The benefits of a Sports Day extend beyond physical fitness. It serves as a platform for developing social skills, promoting inclusivity, and reducing stress through enjoyable physical activities. The event also strengthens community bonds by bringing people together, thereby enhancing social cohesion. Additionally, Sports Day provides an opportunity for local organizations to showcase their commitment to health and well-being, often leading to increased participation in future community initiatives. By celebrating physical activity and teamwork, Sports Day creates a lasting impact on community morale and encourages a culture of health and wellness that benefits society as a whole.

- 170.** Outline the functions of Sports Event Management and discuss how the controlling function contributes to the success of an event.

Ans :

FOREIGN 2010

Sports Event Management is a structured process that encompasses several critical functions including planning, organizing, staffing, directing, and controlling. Each function plays a distinct role in ensuring the event is successful and runs smoothly.

Controlling is a vital function that focuses on monitoring and regulating the execution of an event to ensure it aligns with the established plan. This process involves setting performance standards, tracking progress, and comparing actual outcomes with the planned objectives. For example, during a regional sports festival, the controlling committee continuously monitors various aspects such as adherence to the schedule, budget management, and participant safety. They use checklists, progress reports, and real-time feedback to identify discrepancies early. If a segment of the event deviates from the plan—say,

a delay in the opening ceremony or unexpected weather changes—the controlling team intervenes by implementing corrective measures or activating pre-designed contingency plans.

In addition, the controlling function plays a significant role in resource management. It ensures that all resources—human, financial, and material—are used efficiently and within budget. Post-event evaluations are also part of this function, where detailed reports and performance data are analyzed to understand successes and areas for improvement. This systematic review is invaluable for planning future events, as it provides insights into best practices and common pitfalls. In essence, controlling is the quality assurance mechanism of sports event management, ensuring that every element of the event is aligned with the objectives and that the overall experience for participants and spectators is both enjoyable and safe.

- 171.** Elaborate on the responsibilities of the committees formed in the pre-event, during-event, and post-event phases, including specific examples of their tasks.

Ans :

SQP 2012

In the realm of sports event management, distinct committees are established to address the unique demands of each phase of the event lifecycle. Their responsibilities are structured to ensure comprehensive oversight and smooth transitions between planning, execution, and post-event evaluation.

- 1. Pre-Event Committees :** These committees lay the groundwork by developing the event's overall concept, setting objectives, and securing necessary resources. They are responsible for tasks such as venue selection, budgeting, scheduling, and acquiring sponsorships. For instance, a pre-event logistics committee coordinates transportation, accommodation, and equipment procurement while a marketing committee handles promotions and registration setups. This phase is crucial for establishing clear goals and ensuring all components are in place before the event begins.
- 2. During-Event Committees :** Once the event is underway, the focus shifts to real-time management and operations. During-event committees are tasked with monitoring the schedule, managing on-site logistics, and addressing any unforeseen issues. For

example, an operations committee might oversee the smooth progression of matches, ensure that all teams are informed about their fixtures, and handle emergencies such as medical incidents. Communication among team members is vital here, and dedicated channels are maintained to quickly resolve any disruptions.

- 3. Post-Event Committees :** After the event concludes, the post-event committees take over to evaluate the overall performance and gather feedback. Their responsibilities include conducting debriefing sessions, compiling comprehensive reports, reconciling financial accounts, and reviewing logistical efficiencies. An example of this would be a post-event review committee that surveys participants and staff to determine what aspects of the event were successful and which areas require improvement. This reflective phase is essential for continuous learning, allowing organizers to refine strategies and make better-informed decisions for future events.

- 172.** Explain the procedures involved in organizing a KnockOut tournament. Include details on the use of byes and seeding, and differentiate this format from combination tournaments.

Ans :

COMP 2005

Organizing a KnockOut tournament requires careful planning to ensure fair competition and efficient progression through the rounds. In a typical KnockOut format, participants face off in single-elimination matches, where a loss results in immediate elimination from the tournament. When the number of competitors does not allow for a perfect bracket (typically a power of two), byes are used. A bye allows one or more teams to advance to the next round without playing an initial match, thereby balancing the bracket. For instance, if there are 10 teams, the highest-ranked teams may receive byes to create an even number for subsequent rounds.

Seeding is another critical element in KnockOut tournaments. Seeding involves ranking teams based on past performances or other metrics to ensure that stronger teams do not meet in the early rounds. This process is essential to maintain competitive balance and generate interest as the tournament progresses, allowing for the possibility of a highly anticipated final match between the top competitors.

In contrast, combination tournaments blend elements of both KnockOut and League formats. These tournaments often begin with a group or round-robin stage, where teams play several matches to accumulate points. Following this initial phase, the top teams advance to a KnockOut stage, where the single-elimination format determines the final winner. This hybrid approach ensures that all teams get an opportunity to play multiple matches, which is particularly beneficial for development and ranking purposes, while still culminating in a climactic elimination phase.

Each approach has its merits: the traditional KnockOut format emphasizes quick decision-making and high stakes in every match, while combination tournaments offer a more comprehensive assessment of team abilities before the final elimination rounds.

- 173.** Compare and contrast League tournaments that use the Staircase, Cyclic, and Tabular methods. Provide examples of when each method is most appropriate.

Ans :

DELHI 2011

League tournaments can be structured using various methods to suit different competitive and organizational needs. Three common methods include the Staircase, Cyclic, and Tabular methods, each with distinct features.

1. **Staircase Method :** In the Staircase method, teams are arranged in tiers or “steps” based on their ranking or previous performance. This format is often used when there is a clear hierarchical structure, such as in multi-division leagues with promotion and relegation. The arrangement allows teams to compete primarily with those in their tier, ensuring that promotions and demotions are both fair and competitive. It is most appropriate when the league is designed to evolve over time, rewarding consistent performance and encouraging long-term development.
2. **Cyclic Method :** The Cyclic method follows a round-robin structure where every team plays against every other team in a fixed cycle. This format ensures that all teams have an equal opportunity to compete against each other, and it is ideal for smaller leagues where the number of teams allows for a manageable schedule. The cyclic method is appreciated for its fairness, as it leaves little

room for bias, and is often implemented in local tournaments or amateur leagues.

3. **Tabular Method :** In the Tabular method, the results of each match are recorded in a comprehensive table that includes wins, losses, draws, and points. This method is common in major leagues, such as soccer leagues, where teams’ performances over the season are tracked meticulously. The final standings are determined by the accumulated points, and tie-breakers such as goal differences are used when necessary. This method is especially appropriate in large, competitive environments where detailed records of performance are critical to ranking teams accurately.

Each method is chosen based on the specific needs of the league, the number of teams involved, and the desired balance between competitive fairness and logistical simplicity.

- 174.** Define community sports programs and discuss how events like the Health Run and Run for Unity contribute to community building and health awareness.

Ans :

OD 2013

Community sports programs are initiatives designed to encourage physical activity, foster social cohesion, and promote overall health within a community. These programs typically involve events that are accessible to all age groups and fitness levels, focusing on inclusivity and engagement rather than elite competition.

Health Run and Run for Unity are two prime examples of such events. The Health Run is often organized with the objective of promoting fitness and wellness. It usually involves participants of varying ages and abilities coming together to run a set course, often in support of a health-related cause such as raising awareness for heart health or cancer research. This event not only encourages participants to adopt a more active lifestyle but also raises funds for health initiatives, thereby contributing to both individual well-being and community health education.

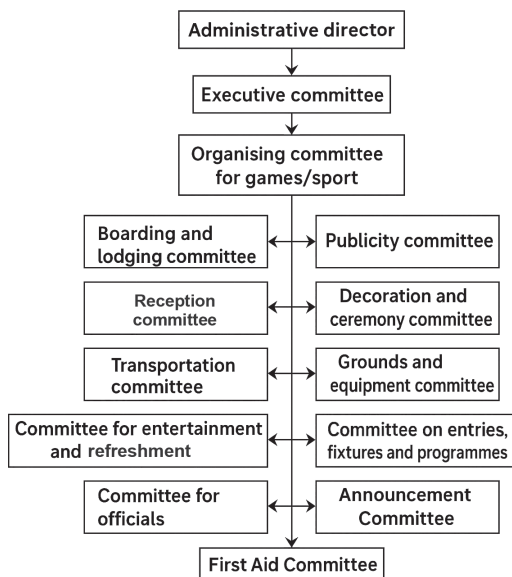
On the other hand, the Run for Unity focuses on strengthening community bonds by celebrating diversity and inclusiveness. It is designed to bring together people from different backgrounds, cultures, and age groups, emphasizing the values of teamwork, mutual respect, and shared community pride. By participating in a common physical activity, individuals build networks

and friendships that transcend everyday social barriers.

Both events play an essential role in community building. They provide an opportunity for local residents to interact, collaborate, and celebrate their shared commitment to health. Additionally, these events often receive support from local authorities and businesses, further reinforcing community ties and encouraging long-term participation in physical activities. The combined focus on health awareness and community solidarity makes such programs a cornerstone of community sports initiatives, promoting a healthier, more united society.

CASE BASED QUESTION

175. While organising sports events for the Annual Sports Day, Arjun and Ravi being the captain and vice-captain of sports, formed various committees as shown below.



On the basis of above given picture answer the following questions :

- The members of this _____ committee are responsible for welcoming guests and spectators.
- The _____ committee responsible for liaison with print media.
- Purchase of sports equipment is a work of the _____ committee.

- Publication of rules and regulations should be done _____.

Ans :

- Logistic Committee
- Marketing Committee
- Finance Committee
- Pre-Event

176. In reference to the picture answer the following questions :



- Which function of Sports Events Management involves setting the objectives and deciding in advance how to achieve them?
 - Organizing
 - Staffing
 - Planning
 - Controlling

Ans :

- Planning
- The process of grouping tasks, assigning them to teams, and coordinating resources to achieve goals is called:
 - Directing
 - Organizing
 - Staffing
 - Planning

Ans :

- Organizing
- Which function ensures that the right people are in the right roles with the necessary skills and support?
 - Staffing
 - Controlling
 - Planning
 - Directing

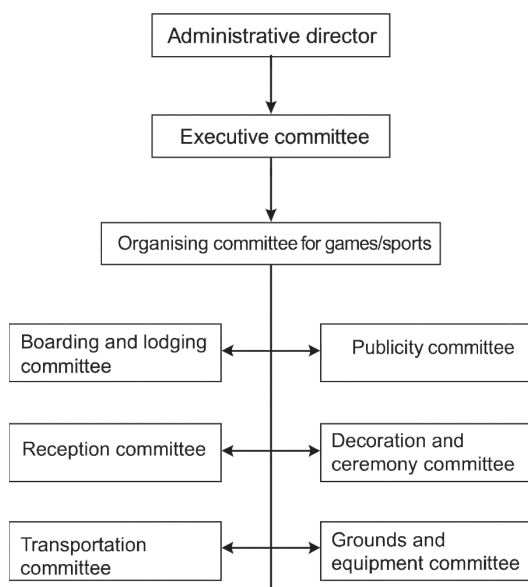
Ans :

- (a) Staffing
- (iv) Giving instructions, supervising teams, and motivating staff to accomplish goals refers to which management function?
- Planning
 - Controlling
 - Directing
 - Organizing

Ans :

- (c) Directing

177. In reference to the picture answer the following questions :



- (i) The Transportation Committee is primarily responsible for:
- Overseeing the final ceremony
 - Arranging vehicles for teams and officials
 - Providing meals to all participants
 - Ensuring the event has enough referees

Ans :

- (b) Arranging vehicles for teams and officials
- (ii) The Publicity Committee should:
- Create and distribute event posters, banners, and announcements
 - Manage the accommodation for teams and officials
 - Arrange opening and closing ceremonies
 - Provide first aid and medical services

Ans :

- (a) Create and distribute event posters, banners, and announcements

- (iii) The Reception Committee is responsible for:
- Scheduling matches and drawing fixtures
 - Welcoming guests, officials, and participants upon arrival
 - Providing equipment like balls, nets, or scoreboards
 - Maintaining cleanliness of the venue

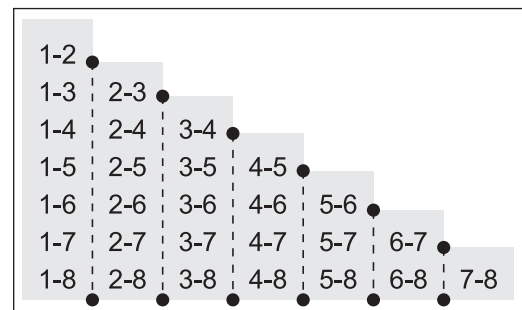
Ans :

- (b) Welcoming guests, officials, and participants upon arrival
- (iv) The Grounds and Equipment Committee should not be doing:
- Preparing the venue and its equipment for matches
 - Providing meals to the participants
 - Checking if officiating tools (e.g., scoreboards, timers) are functional
 - Ensuring the playing area is marked and ready

Ans :

- (b) Providing meals to the participants

178. In reference to the picture answer the following questions :



- (i) What type of fixture is shown in the diagram?
- Knockout Fixture
 - League (Round-Robin) Fixture
 - Challenge Fixture
 - Combination Fixture

Ans :

- (b) League (Round-Robin) Fixture
- (ii) In a single round-robin league with 8 teams, how many total matches are played?
- 15
 - 28
 - 36
 - 42

Ans :

- (b) 28

(iii) How many matches does each team play in this single round-robin format?

- (a) 7
- (b) 8
- (c) 9
- (d) 14

Ans :

(a) 7

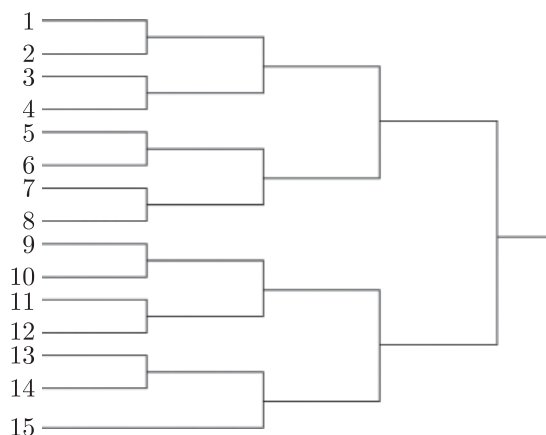
(iv) Which of the following pairs would not appear in an 8-team round-robin fixture?

- (a) 1-9
- (b) 2-3
- (c) 4-6
- (d) 7-8

Ans :

(a) 1-9

179. In reference to the picture answer the following questions :



(i) The fixture shown is best described as:

- (a) Round-Robin
- (b) Knockout (Single-Elimination)
- (c) Challenge Tournament
- (d) Combination Fixture

Ans :

(b) Knockout (Single-Elimination)

(ii) In a 16-team single-elimination tournament, how many total matches are required to determine a winner?

- (a) 7
- (b) 8
- (c) 15
- (d) 31

Ans :

(c) 15

(iii) In a knockout tournament, if a team loses a match, what is the usual consequence?

- (a) They remain in the tournament
- (b) They are eliminated from the tournament
- (c) They receive a bye in the next round
- (d) They move to a lower bracket

Ans :

(b) They are eliminated from the tournament

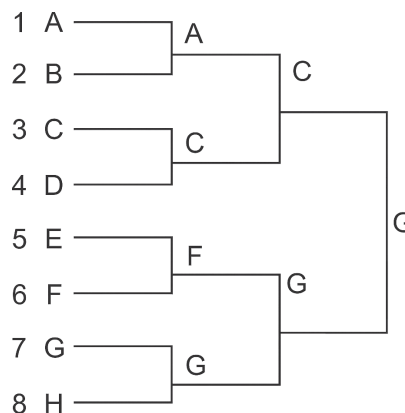
(iv) How many rounds are needed to decide a winner in a 16-team single-elimination format?

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Ans :

(c) 4

180. In reference to the picture answer the following questions :



(i) The fixture shown is best described as:

- (a) Round-Robin
- (b) Knockout (Single-Elimination)
- (c) Challenge Tournament
- (d) Combination Fixture

Ans :

(b) Knockout (Single-Elimination)

(ii) In an 8-team single-elimination tournament, how many total matches are required to determine a winner?

- (a) 4
- (b) 6
- (c) 7
- (d) 8

Ans :

(c) 7

- (iii) How many rounds are needed to decide a winner in an 8-team single-elimination format?

(a) 2
(b) 3
(c) 4
(d) 5

Ans :

(b) 3

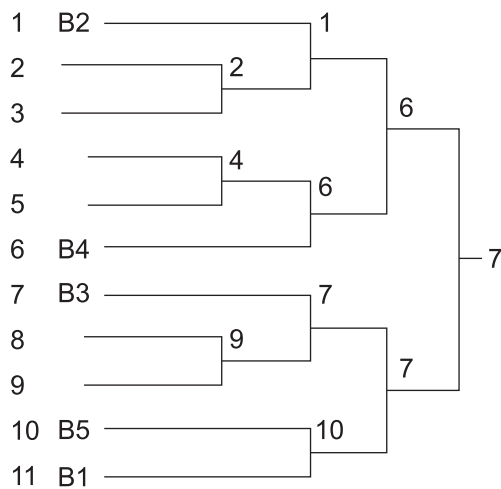
- (iv) Which match decides the final winner in a single-elimination bracket?

(a) Quarterfinal
(b) Semifinal
(c) Preliminary Round
(d) Final

Ans :

(d) Final

- 181.** In reference to the picture answer the following questions :



- (i) What type of fixture is shown in the diagram?
(a) Round-Robin
(b) Knockout (Single-Elimination)
(c) League-Cum-Knockout
(d) Challenge Tournament

Ans :

(b) Knockout (Single-Elimination)

- (ii) How many total teams are participating in this bracket?

(a) 8
(b) 10
(c) 11
(d) 12

Ans :

(c) 11

- (iii) How many byes are given in this fixture?

(a) 3
(b) 4
(c) 5
(d) 6

Ans :

(c) 5

- (iv) How many total matches are needed to determine the winner?

(a) 8
(b) 9
(c) 10
(d) 11

Ans :

(c) 10

- 182.** In reference to the picture answer the following questions :

	I	II	III	IV	V
	Round	Round	Round	Round	Round
6	1	5	1	4	1
5	2	4	6	3	5
4	3	3	2	2	6
		2	6	6	5
					4

- (i) What type of fixture is shown in the diagram?
(a) Knockout
(b) Round-Robin
(c) Challenge Tournament
(d) Combination Fixture

Ans :

(b) Round-Robin

- (ii) How many rounds are shown for the 6-team fixture?

(a) 3
(b) 4
(c) 5
(d) 6

Ans :

(c) 5

- (iii) How many matches does each team play in a single round-robin with 6 teams?

(a) 4
(b) 5
(c) 6
(d) 7

Ans :

(b) 5

(iv) How many total matches are played in a single round-robin for 6 teams?

- (a) 10
(b) 12
(c) 15
(d) 18

Ans :

(c) 15

183. In reference to the picture answer the following questions :

I Round	II Round	III Round	IV Round	V Round	VI Round	VII Round
7 Bye 6 1 5 2 4 3	6 Bye 5 7 4 1 3 2	5 Bye 4 6 3 7 2 1	4 Bye 3 5 2 6 1 7	3 Bye 2 4 1 5 7 6	2 Bye 1 3 7 4 6 5	1 Bye 7 2 6 3 5 4

- (i) What type of fixture is shown in the diagram?
(a) Knockout
(b) Round-Robin
(c) Challenge Tournament
(d) Combination Fixture

Ans :

(b) Round-Robin

(ii) How many rounds are needed for a 7-team single round-robin tournament?

- (a) 5
(b) 7
(c) 9
(d) 10

Ans :

(b) 7

(iii) How many matches does each team play in this 7-team single round-robin format?

- (a) 5
(b) 6
(c) 7
(d) 8

Ans :

(b) 6

(iv) How many total matches are played in a 7-team single round-robin?

- (a) 15
(b) 18
(c) 21
(d) 28

Ans :

(c) 21

184. In reference to the picture answer the following questions :

A Vs B						
A Vs C	B Vs C					
A Vs D	B Vs D	C Vs D				
A Vs E	B Vs E	C Vs E	D Vs E			
A Vs F	B Vs F	C Vs F	D Vs F	E Vs F		
A Vs G	B Vs G	C Vs G	D Vs G	E Vs G	F Vs G	

- (i) What type of fixture is shown in the diagram?
(a) Knockout
(b) Round-Robin
(c) Challenge Tournament
(d) Combination Fixture

Ans :

(b) Round-Robin

(ii) How many teams are participating in this fixture?

- (a) 6
(b) 7
(c) 8
(d) 9

Ans :

(b) 7

(iii) How many matches are played in total for a single round-robin among 7 teams?

- (a) 15
(b) 18
(c) 21
(d) 28

Ans :

(c) 21

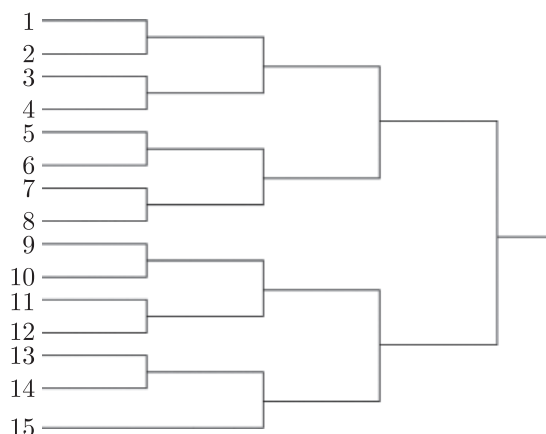
(iv) How many matches does each team play in a 7-team single round-robin format?

- (a) 5
(b) 6
(c) 7
(d) 8

Ans :

(b) 6

185. Study the fixture given below :



On the basis of the above study and your knowledge, answer the following questions:

- According to the above fixture total number of rounds will be _____.
- As shown in the fixture if the winner team plays least number of matches, then which number of team is the winner?
- What is the formula for calculating number of matches in a knockout tournament?
- If 16 teams are participating in a knockout tournament, then how many byes will be given to draw a knockout fixture?

or

- What is the formula for calculating total number of byes in a knockout tournament?

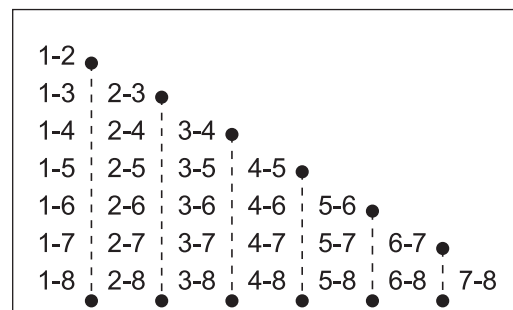
Ans :

- 4
- 15
- Formula for calculating number of matches in knock-out tournament = $N - 1$
Where, N is total number of teams.
- Zero

or

- Byes can be calculated by subtracting the number of teams from next higher number, which is a power of two. Suppose, 13 teams are competing, then number of byes will be $16 : 13 = 3$ byes.

186. On the basis of above fixture, answer the following questions :



- Which method is shown in the picture to draw fixture in league tournament ?
- What is the formula to calculate number of matches?
- In league or round robin tournament winner will be decided on the basis of _____.
- If 7 teams participate in a league tournament _____ number of matches will be played.

Ans :

2023

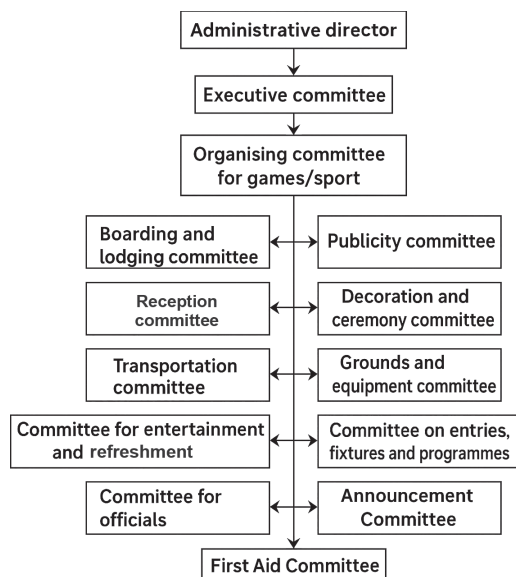
- Stair case
- Formula of calculating number of matches
$$= \frac{N(N-1)}{2}$$
- After the tournament all the teams are awarded the score as per their performance and the team which scores maximum is declared winner.
- No. of matches will be played

$$= \frac{7(7-1)}{2} = \frac{7 \times 6}{2} = 21$$

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187. While organising sports events for the Annual Sports Day, Arjun and Ravi being the captain and vice-captain of sports, formed various committees as shown below.

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On the basis of above given picture answer the following questions :

- The members of this _____ committee are responsible for welcoming guests and spectators.
- The _____ committee responsible for liaison with print media.
- Purchase of sports equipment is a work of the _____ committee.
- Publication of rules and regulations should be done _____.

Ans :

- Logistic Committee
- Marketing Committee
- Finance Committee
- Pre-Event

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CHAPTER 2

CHILDREN AND WOMEN IN SPORTS

SUMMARY

1. WHO EXERCISE GUIDELINES FOR DIFFERENT AGE GROUPS

The World Health Organization (WHO) has developed detailed exercise guidelines that are tailored to meet the unique needs of different age demographics. These guidelines emphasize that regular physical activity is a cornerstone of overall health and a key factor in reducing the risk of chronic diseases, enhancing mental health, and improving quality of life.

1.1 For Children and Adolescents

Children and adolescents are advised to engage in at least 60 minutes of moderate-to-vigorous physical activity daily. This activity should be varied and include aerobic exercises that boost cardiovascular health, as well as muscle-strengthening and bone-building exercises. These activities support healthy growth, enhance motor skills, and contribute to the development of strong bones and muscles. Additionally, activities that improve balance and coordination are recommended to lay a solid foundation for lifelong physical activity.

1.2 For Adults

Adults should aim for at least 150 minutes of moderate-intensity aerobic activity per week, or 75 minutes of vigorous-intensity activity. In addition, muscle-strengthening exercises should be performed on two or more days per week. These recommendations help in maintaining cardiovascular health, managing body weight, and preventing conditions such as hypertension, diabetes, and obesity. Regular physical activity among adults is also associated with improved mood, reduced stress, and enhanced cognitive function.

1.3 For Older Adults

Older adults are encouraged to follow similar guidelines as younger adults, but with additional emphasis on activities that enhance balance, flexibility, and strength. This group is particularly advised to include exercises that reduce the risk of falls and support functional independence. The guidelines also stress the importance of adapting physical activity to individual capabilities, ensuring that even those with chronic conditions can participate safely. Programs such as gentle stretching, yoga, or tai chi are highly recommended to complement aerobic and resistance training, thereby promoting overall physical stability and mental well-being.

2. COMMON POSTURAL DEFORMITIES AND THEIR CORRECTIVE MEASURES

Poor posture can significantly impair physical function and quality of life. This section explores several common postural deformities, discussing their causes, clinical presentations, and evidence-based corrective measures.

2.1 Knock Knees (Genu Valgum)

Knock knees occur when the knees angle inward, often leading to an abnormal gait and discomfort. This condition may result from developmental factors or prolonged poor alignment. Corrective measures include a regimen of physical therapy exercises that focus on strengthening the quadriceps, hip abductors, and outer thigh muscles. In some cases, the use of orthotic devices or specialized bracing is recommended to help realign the knees. Severe cases might even require surgical correction to prevent further complications and restore proper function.

2.2 Flat Foot (Pes Planus)

Flat foot, characterized by the absence of a pronounced arch in the foot, can lead to pain and instability. Causes include genetic predisposition,

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overuse injuries, or obesity. Treatment typically involves using custom orthotic insoles that support the arch and provide shock absorption. Additionally, exercises that strengthen the intrinsic muscles of the foot, along with proper footwear that offers ample support and cushioning, are crucial. Physical therapy may also be recommended to address any underlying biomechanical issues.

2.3 Round Shoulders

Round shoulders, where the shoulder blades roll forward, are often the result of prolonged poor posture, such as excessive sitting or hunching over electronic devices. Corrective strategies involve a combination of stretching exercises to loosen the chest and anterior shoulder muscles and strengthening exercises for the upper back and scapular stabilizers. Ergonomic interventions, such as adjusting workstation height and ensuring proper seating posture, are essential to prevent recurrence.

2.4 Lordosis

Lordosis refers to an excessive inward curvature of the lower spine, frequently seen in individuals with weak core muscles or those who maintain prolonged postures that promote lumbar hyperextension. Treatment involves core stabilization exercises, stretching of the hip flexors, and strengthening of the abdominal muscles. Postural retraining and, in some cases, the use of lumbar support devices may be recommended to alleviate discomfort and correct spinal alignment.

2.5 Kyphosis

Kyphosis, characterized by an excessive outward curvature of the upper spine, often leads to a hunched back appearance. This condition can be exacerbated by age-related degenerative changes or poor posture during formative years. Therapeutic approaches include exercises aimed at strengthening the back extensor muscles, targeted physical therapy, and the use of spinal orthoses to support proper alignment. In advanced cases, surgical intervention might be necessary to correct severe curvature.

2.6 Scoliosis

Scoliosis involves a lateral curvature of the spine, typically identified during adolescence. Its progression can be monitored through regular clinical assessments and imaging studies.

Depending on the degree of curvature, treatment may range from observation and targeted exercises to bracing and, in severe cases, surgical correction. Early detection and intervention are key to managing scoliosis effectively and preventing long-term complications.

2.7 Bow Legs (Genu Varum)

Bow legs, where the legs curve outward, can lead to biomechanical inefficiencies and discomfort. Early intervention with physical therapy—focusing on stretching and strengthening the muscles around the knees and hips—can help in correcting this alignment. In persistent or severe cases, orthotic interventions or surgical procedures may be necessary to achieve proper leg alignment and function.

3. WOMEN'S PARTICIPATION IN SPORTS

The active involvement of women in sports has transformative effects that extend well beyond physical fitness. This segment outlines a spectrum of benefits:

3.1 Physical Benefits

Participation in sports enhances cardiovascular endurance, builds muscle strength, improves flexibility, and contributes to overall physical robustness. Regular physical activity can aid in weight management, reduce the risk of chronic illnesses, and improve musculoskeletal health. It also helps in enhancing metabolic efficiency and energy levels, which are critical for long-term well-being.

3.2 Psychological Benefits

Engaging in sports has profound psychological benefits. It has been shown to reduce symptoms of stress, anxiety, and depression by promoting the release of endorphins and other mood-enhancing chemicals. Sports participation also boosts self-confidence, encourages goal setting, and fosters a sense of accomplishment. The mental discipline required in sports can improve concentration, resilience, and overall mental health, leading to a more positive outlook on life.

3.3 Social Benefits

Women's involvement in sports plays a pivotal role in social integration and community building. Sports provide a platform for networking, teamwork, and mutual support. They create opportunities for leadership and empowerment,

helping to challenge societal stereotypes and promote gender equality. By participating in sports, women can form strong support networks, enhance interpersonal skills, and contribute to a more inclusive and dynamic community environment.

Through these multidimensional benefits, sports empower women to lead healthier, more active lives while contributing to broader societal change and gender empowerment.

4. SPECIAL CONSIDERATIONS

4.1 Menarche

Menarche is the onset of the first menstrual period, marking a key milestone in female puberty and reproductive development. It typically occurs during adolescence and is influenced by factors such as genetics, nutrition, and overall health. For many athletes, particularly those involved in high-intensity training, menarche may be delayed due to the physical demands and energy expenditure associated with rigorous exercise routines. A delayed menarche can affect physical and emotional development, making it essential for coaches, parents, and healthcare providers to monitor and support young athletes through this critical transition.

4.2 Menstrual Dysfunction

Menstrual dysfunction refers to irregularities or abnormalities in the menstrual cycle that may manifest as irregular cycles, amenorrhea (the absence of menstruation), or other hormonal imbalances. These issues are particularly common among female athletes who engage in strenuous training regimens combined with insufficient caloric intake, leading to an energy deficit. Menstrual dysfunction not only impacts reproductive health but also has broader consequences, such as reduced bone density, impaired cardiovascular function, and altered metabolic balance. Early detection, nutritional counseling, and appropriate adjustments to training intensity are vital in managing menstrual dysfunction, ensuring that female athletes maintain optimal health and performance while minimizing long-term complications.

5. FEMALE ATHLETE TRIAD

The Female Athlete Triad is a critical syndrome that encompasses three interrelated conditions—

osteoporosis, amenorrhea, and eating disorders—that disproportionately affect female athletes. Each component of the triad has significant implications for health and athletic performance:

5.1 Osteoporosis

Osteoporosis is characterized by reduced bone mineral density, making bones more fragile and susceptible to fractures. This condition is particularly concerning for athletes who may not consume adequate amounts of calcium and vitamin D, especially when high levels of physical activity increase the demand for these nutrients. Maintaining bone health requires a balanced diet rich in essential nutrients, along with appropriate weight-bearing exercises to stimulate bone formation and remodeling.

5.2 Amenorrhea

Amenorrhea, the absence of menstrual periods, often results from a state of low energy availability, where the energy expended in training exceeds the energy consumed through nutrition. This imbalance disrupts normal hormonal regulation, leading to a cessation of menstruation. Amenorrhea is not only an indicator of compromised reproductive health but also contributes to further bone loss, thereby increasing the risk of osteoporosis. Monitoring menstrual function is a critical aspect of managing the health of female athletes.

5.3 Eating Disorders

Disordered eating behaviors, which may include restrictive dieting, binge eating, or purging, are often employed by athletes seeking to control body weight for performance reasons. These behaviors exacerbate energy deficits and contribute to the hormonal disturbances that underpin amenorrhea and bone loss. Early detection of eating disorders is essential for preventing the progression of the Female Athlete Triad. A multidisciplinary intervention involving nutritionists, psychologists, and medical professionals is necessary to provide the support required to restore a healthy balance between energy intake and expenditure.

Addressing the Female Athlete Triad involves a comprehensive and collaborative approach. This includes educational initiatives to raise awareness, regular health screenings to identify early signs of the syndrome, and the implementation of tailored training and nutritional strategies that support long-term health and performance. The goal is to create an environment where female athletes can

excel competitively while maintaining optimal physiological well-being.

MULTIPLE CHOICE QUESTION

1. According to W.H.O. (World Health Organisation) recommendations, children of _____ should be engaged in physical activities for 180 minutes and should have 10-13 hours of good quality sleep per day.
- Less than 1 year
 - 1-2 year
 - 3-4 year
 - 5-17 year

Ans :

2024

(c) 3-4 year

WHO recommends that preschool children (3-4 years) engage in 180 minutes of varied physical activity and obtain 10-13 hours of quality sleep. These guidelines help promote optimal physical growth, motor skill development, and overall wellbeing during a critical developmental period.

2. **Assertion (A)** : “Achieving health for all means doing what is best for health right from the beginning of people’s lives” says WHO Director General Dr. Tedros Adhanom Ghebreyesus.

Reason (R) : For children, at least 180 minutes of physical activities of which 60 minutes is moderate to vigorous intensity physical activity should be planned. In the context of the above two statements, which one of the following is correct?

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is not the correct explanation of A.
- A is true, but R is false.
- A is false, but R is true.

Ans :

Term-I, 2021-22

(b) Both A and R are true but R is not the correct explanation of A.

Both statements are factually correct. The assertion emphasizes early health promotion while the reason provides a physical activity guideline for children. However, the guideline does not directly explain the broad concept of “health for all” from early life.

3. **Assertion (A)** : In a normal standing posture, both knees touch each other, while there is a gap of 3-4 inches between the ankles.

Reason (R) : It is due to Genu Valgum and it can develop due to an injury or infection in the knee or leg, rickets, severe lack of vitamin D and calcium, obesity, or arthritis in the knee.

In the context of the above two statements, which one of the following option is correct ?

- Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
- Assertion (A) is true, but Reason (R) is false.
- Assertion (A) is false, but Reason (R) is true.

Ans :

2024

(d) Assertion (A) is false, but Reason (R) is true. Genu valgum is a knee misalignment where the knees turn inward, causing them to touch or knock against each other in a normal standing position, while the ankles remain approximately 3-4 inches apart.

Match the following :

	List-I		List-II
I.	Knock Knee (Genu Valgum)	1.	Increase exaggeration of backward curve
II.	Kyphosis	2.	Wide gap between the knees when standing with feet together
III.	Lordosis	3.	Knees touch each other in normal standing position.
IV.	Bow legs	4.	Inward curvature of the spine

Choose the correct option from the following.

- | | | | | |
|-----|---|----|-----|----|
| | I | II | III | IV |
| (a) | 3 | 1 | 4 | 2 |
| (b) | 1 | 3 | 4 | 2 |
| (c) | 4 | 2 | 1 | 3 |
| (d) | 2 | 3 | 4 | 1 |

Ans :

2023

- (a) I-3, II-1, III-4, IV-2

Knock knee (genu valgum) is identified by knees touching, matching with 3. Kyphosis exaggerates a backward curve corresponding to 1, Lordosis indicates an inward curvature matching 4, and bow legs present a wide knee gap, pairing with 2, respectively.

5. Floor based physical activities should be planned for
- less than 1 year child
 - 1 2 years child
 - 3 4 years child
 - 5 17 years child

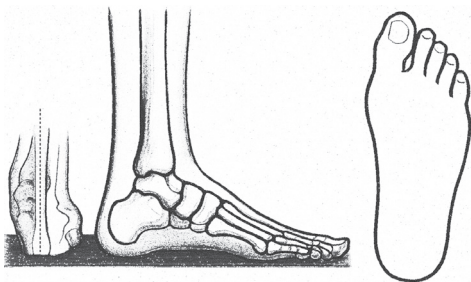
Ans :

Term-I, 2021-22

- (a) less than 1 year child

Infants under one year benefit most from floor-based activities that safely encourage motor skills development. Such play enhances balance, coordination, and muscle strength, establishing an essential foundation for mobility and overall physical growth during early developmental stages.

6. Which postural deformity is shown in the illustration?



- Bow Leg
- Knock Knee
- Flat Foot
- Round Foot

Ans :

Term-I, 2021-22

- (c) Flat Foot

The illustration shows a reduced or absent arch characteristic of flat foot. This deformity affects the biomechanics of the foot by altering weight distribution and gait, thereby necessitating early intervention through exercises, orthotics, or corrective measures to improve arch support.

7. "Sway Back" is also known as
- Lordosis
 - Kyphosis
 - Scoliosis
 - Round shoulder

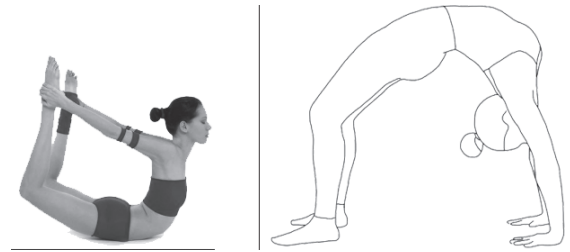
Ans :

Term-I, 2021-22

- (a) Lordosis

"Sway back" posture is marked by an excessive inward curvature of the lower back, clinically referred to as lordosis. This condition results from an anterior pelvic tilt and weakened abdominal muscles, which together disrupt normal spinal alignment and can lead to discomfort.

8. Asanas shown in the picture are performed to correct.



- Kyphosis and Lordosis
- Round shoulder and Kyphosis
- Scoliosis and Lordosis
- Lordosis and Round shoulder

Ans :

Term-I, 2021-22

- (b) Round shoulder and Kyphosis

"Sway back" posture is marked by an excessive inward curvature of the lower back, clinically referred to as lordosis. This condition results from an anterior pelvic tilt and weakened abdominal muscles, which together disrupt normal spinal alignment and can lead to discomfort.

9. Match the following postural deformities with their corrective Asanas.

	Postural deformities		Asanas
(A)	Flat Foot	(1)	
(B)	Scoliosis	(2)	

(C)	Knock-knee	(3)	
(D)	Lordosis	(4)	

Select the correct answer.

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 1 | 4 | 3 | 2 |
| (b) | 2 | 3 | 1 | 4 |
| (c) | 2 | 1 | 3 | 4 |
| (d) | 1 | 4 | 2 | 3 |

Ans :

Term-I, 2021-22

(d) A-1, B-4, C-2, D-3

In the matching exercise, flat foot aligns with asana 1 for arch strengthening, scoliosis with asana 4 for lateral correction, knock-knee with asana 2 to adjust leg alignment, and lordosis with asana 3 to reduce excessive lumbar curvature, effectively targeting each condition.

- 10.** Scoliosis is a postural deformity related with
- foot
 - leg
 - vertebral column
 - hand

Ans :

SQP 2020

(c) vertebral column

Scoliosis is defined by an abnormal lateral curvature of the spine, affecting the vertebral column. This condition distorts normal spinal alignment, leading to potential respiratory and functional issues, and requires targeted therapeutic and sometimes surgical interventions to manage progression.

- 11.** Following are the constraints for women which restrict their participation in sports, except-
- Psychological constraints
 - Social constraints
 - Eating habits
 - Economical constraints.

Ans :

Term-I, 2021-22

(c) Eating habits

Women's participation in sports is typically restricted by psychological, social, and economic factors. In contrast, eating habits are generally not considered a constraint, as they do not directly limit access or opportunities in sports, making them an exception among the provided options.

- 12.** Mirabai Chanu is from a very simple family but she always used to dream big. Though she knew that her family would not be able to afford her nutrition still she continued to pursue her dreams, And finally the day came when she won the silver medal in weight-lifting in Tokyo Olympics. The women who got two medals in Olympics is-
- P.V. Sindhu
 - Lovlina Borgohain
 - Sakshi Malik
 - Mirabai Chanu

Ans :

Term-I, 2021-22

(a) P.V. Sindhu

Despite the narrative about Mirabai Chanu's humble beginnings, the question identifies the woman with two Olympic medals. P.V. Sindhu, renowned for her success in badminton with multiple Olympic podium finishes, is correctly recognized as the athlete with two medals.

- 13.** Menarche is defined as the
- Ending of menstrual period in women
 - Beginning of menstrual period in women
 - Time of pregnancy
 - Beginning of pregnancy.

Ans :

2023, 2020

(b) Beginning of menstrual period in women

Menarche is the onset of the first menstrual cycle in girls, marking the beginning of reproductive capability. This milestone signifies the transition from childhood to adolescence and indicates the proper progression of physical and hormonal development during puberty.

- 14.** Kyphosis is also known as ____.
- Hallow Back
 - Hunch Back
 - Curve Back
 - both (a) and (b)

Ans :

2023-24

(b) Hunch Back

Kyphosis, characterized by an exaggerated forward curvature of the upper spine, is commonly called

a hunch back. This descriptive term highlights the visible rounded appearance of the back due to structural changes in the vertebrae, leading to compromised posture and discomfort.

15. Match the following :

	List-I		List-II
I.	Garudasana	1.	Round shoulder
II.	Gomukhasana	2.	Lordosis
III.	Chakrasana	3.	Bow legs
IV.	Naukasana	4.	Knock knees

Choose the correct option from the following :

- (a) I-3, II-4, III-1, IV-2
(b) I-1, II-3, III-4, IV-2
(c) I-4, II-2, III-1, IV-3
(d) I-2, II-3, III-4, IV-1

Ans :

Term-I, 2021-22

- (a) I-3, II-4, III-1, IV-2

In the matching exercise, Garudasana corresponds to bow legs correction (3), Gomukhasana addresses knock knees (4), Chakrasana improves round shoulder (1), and Naukasana assists in correcting lordosis (2). Each asana is selected to target specific postural misalignments.

16. What is the name of the postural deformity caused due to increase in the curve at the lumbar region?
(a) Knock knees
(b) Bow legs
(c) Kyphosis
(d) Lordosis

Ans :

Term-I, 2021-22

- (d) Lordosis

An increased inward curve of the lumbar spine is known as lordosis. This postural deformity, characterized by an exaggerated arch in the lower back, can lead to discomfort and impaired mobility, often requiring targeted strengthening and stretching exercises for correction.

17. Which postural deformity has Convexities right or left?
(a) Flat foot
(b) Knock knees
(c) Kyphosis
(d) Scoliosis

Ans :

Term-I, 2021-22

- (d) Scoliosis

Scoliosis presents as a lateral deviation of the spine, resulting in a convexity to the right or left.

This abnormal curvature disrupts normal spinal alignment, affecting posture and balance, and is typically managed through exercise, bracing, or, in severe cases, surgery.

18. Which of the following is not a spinal curvature deformity?

- (a) Kyphosis
(b) Scoliosis
(c) Lordosis
(d) Flatfoot

Ans :

Term-I, 2021-22

- (d) Flatfoot

Among the options, flatfoot is not a spinal curvature deformity but a condition affecting the foot's arch. Kyphosis, scoliosis, and lordosis involve abnormal curvatures of the spine, whereas flatfoot concerns the structural integrity of the foot's arch and biomechanics.

19. Which postural deformity is related to Posterior curve of the spine?

- (a) Scoliosis
(b) Kyphosis
(c) Lordosis
(d) Knock knees

Ans :

Term-I, 2021-22

- (b) Kyphosis

Kyphosis refers to an abnormal, excessive posterior curvature of the thoracic spine, resulting in a hunched back. This condition alters normal spinal alignment and can cause pain and functional limitations, requiring corrective exercises and postural modifications for improvement.

20. Which exercise should be done to cure this deformity?



- (a) Skipping
(b) Walking on heels
(c) Both (a) and (b)
(d) Hanging on horizontal bar

Ans :

Term-I, 2021-22

(c) Both (a) and (b)

Both skipping and walking on heels strengthen lower limb muscles, improve balance, and promote proper weight distribution. These exercises help correct specific postural deformities by reinforcing the muscles and joints responsible for maintaining proper alignment and reducing abnormal curvatures.

21. Halasana is used for curing which of the following deformities?

- (a) Kyphosis
- (b) Scoliosis
- (c) Lordosis
- (d) Flatfoot

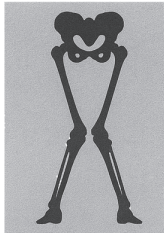
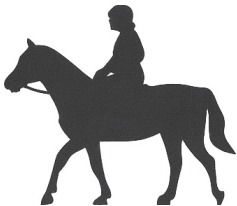
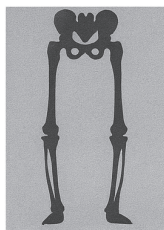
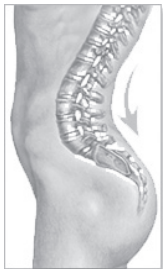
Ans :

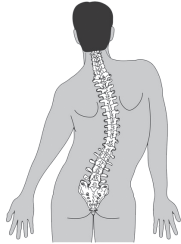
Term-I, 2021-22

(c) Lordosis

Halasana, or the plow pose, is an effective yoga posture for reducing lordosis. It stretches and strengthens the muscles supporting the lumbar spine, helping to diminish the exaggerated inward curvature and improve overall spinal alignment, thereby alleviating discomfort associated with lordosis.

22. Match the postural deformities with their remedial activity:

A.		1.	
B.		2.	
C.		3.	

D.		4.	
----	--	----	---

Select the correct answer.

	A	B	C	D
(a)	3	1	4	2
(b)	4	1	3	2
(c)	3	2	4	1
(d)	4	2	3	1

Ans :

Term-I, 2021-22

(c) A-3, B-2, C-4, D-1

Based on the provided solution, this image matches postural deformities with their remedial activities. Knock knees (A) are linked to Trikonasana (3), bow legs (B) to Chakrasana (2), lordosis (C) to Garudasana (4), and scoliosis (D) to horse riding (1) for correction.

23. Assertion (A) : Physical activities as corrective measure are very effective in functional deformity in comparison to structural deformity.

Reason (R) : Muscles and ligaments are affected in functional deformity.

- (a) Both A and R are true, but R is not the correct explanation of A.
- (b) Both A and R are true and R is the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

Ans :

Term-I, 2021-22

(b) Both A and R are true and R is the correct explanation of A.

Functional deformities, resulting from muscle and ligament imbalances, respond effectively to corrective physical activities. The assertion states that these interventions are more effective for functional rather than structural issues, and the reason confirms that muscles and ligaments are primarily affected, thereby justifying the approach.

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- 24.** Sandy is diagnosed with postural adaptation of the spine in lateral direction. The curve is identified as convexity right. It happened due to Sandy's underdeveloped legs and carrying heavy loads on one side only.

What kind of postural deformity doctors found in Sandy?

- (a) Scoliosis
- (b) Kyphosis
- (c) Bow Legs
- (d) Flatfoot

Ans :

Term-I, 2021-22

- (a) Scoliosis

Sandy's diagnosis of a lateral spinal curve with a right convexity, compounded by unequal leg development and asymmetric load carrying, is indicative of scoliosis. This condition involves an abnormal lateral curvature of the spine, affecting overall posture and requiring targeted corrective measures.

- 25.** Posture plays a very significant role in our daily activities. Correct posture means the balancing of the body in an accurate and proper manner. Various types of postural deformities can be identified in individuals.



From the above given picture, the deformities seen on the left most is caused due to deficiency of which nutrient?

- (a) Iron
- (b) Calcium
- (c) Vit D
- (d) Both (b) and (c)

Ans :

Term-I, 2021-22

- (d) Both (b) and (c)

The deformity shown in the picture is commonly due to deficiencies in calcium and vitamin D. Both nutrients are essential for proper bone mineralization and strength; inadequate levels lead to compromised bone structure and potential deformities, emphasizing the need for balanced nutrition.

- 26.** Weakening of bones due to loss of bone density and improper bone formation is known as _____.

- (a) Amenorrhea
- (b) Anorexia Nervosa
- (c) Osteoporosis
- (d) Lordosis

Ans :

2022-23

- (c) Osteoporosis

Osteoporosis is characterized by decreased bone density and impaired bone formation, leading to fragile bones and an increased risk of fractures. This condition results from an imbalance in bone remodeling processes, making bones weak and susceptible to injury without adequate preventive and therapeutic measures.

- 27.** If the menstruation cycle does not begin at puberty, the condition is called _____.

- (a) Primary amenorrhea
- (b) Secondary amenorrhea
- (c) Oligomenorrhea
- (d) Dysmenorrhea

Ans :

2023-24

- (a) Primary amenorrhea

When menstruation does not begin by the expected age during puberty, it is termed primary amenorrhea. This condition suggests a delay or abnormality in reproductive system development, requiring medical evaluation to identify underlying causes and implement appropriate treatment interventions.

- 28. Assertion (A) :** WHO recommends that children aged 5–17 engage in at least 60 minutes of moderate-to-vigorous physical activity daily.

Reason (R) : This guideline is based on extensive research showing that daily exercise improves cardiovascular health, muscle strength, and mental well-being in children.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2017

- (a) Both A and R are true, and R is the correct explanation for A.

WHO's recommendation is grounded in research linking daily moderate-to-vigorous activity with enhanced physical and mental development. The reason correctly explains that these benefits stem from the comprehensive improvements in cardiovascular and musculoskeletal health as well

as mood regulation.

- 29. Assertion (A) :** In pediatric cases, knock knees are often corrected effectively through physiotherapy and the use of orthotic devices.

Reason (R) : Knock knees are always caused by irreversible skeletal malformations that require surgical correction.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2007

- (c) A is true but R is false

While conservative management (physiotherapy and orthotics) is effective for many children with knock knees, the reason is false because knock knees are not invariably due to fixed, irreversible malformations. Surgery is rarely needed in growing children, making the reason incorrect.

- 30. Assertion (A) :** Round shoulders are not merely a cosmetic issue; they can affect posture and lead to musculoskeletal discomfort.

Reason (R) : Postural exercises and stretching are ineffective in improving round shoulder posture.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2010

- (d) Both A and R are false

The assertion is true because round shoulders can impair posture and cause discomfort; however, the reason is false. Numerous studies support that postural exercises and stretching effectively correct round shoulders, proving that both statements cannot be simultaneously true as stated.

- 31. Assertion (A) :** Participation in team sports enhances leadership skills among young athletes.

Reason (R) : Team sports require following coaches' instructions.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.

- (c) A is true but R is false.

- (d) Both A and R are false.

Ans :

FOREIGN 2003

- (b) Both A and R are true, but R is not the correct explanation for A

Both statements are true; team sports do help develop leadership skills. However, the reason given is incomplete. While following instructions is part of the experience, leadership development also stems from decision-making, conflict resolution, and peer interaction, making the reason an inadequate explanation.

- 32. Assertion (A) :** Special considerations for female athletes include monitoring the onset of menarche and managing menstrual dysfunction.

Reason (R) : Early menarche invariably predicts superior athletic performance in female athletes.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2015

- (c) A is true but R is false

It is essential to monitor menstrual health in female athletes, as irregularities can indicate energy deficits or stress. However, the reason is false because early menarche does not guarantee better athletic performance; many other factors influence performance outcomes.

- 33. Assertion (A) :** Adhering to WHO exercise guidelines across age groups improves overall health and reduces the risk of chronic diseases.

Reason (R) : These guidelines are formulated based on evidence linking regular physical activity to reduced risks of cardiovascular, metabolic, and musculoskeletal disorders.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2018

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is accurate because regular adherence to WHO guidelines is associated with better

overall health. The reason is also correct; extensive epidemiological studies have shown that consistent physical activity lowers the risk of multiple chronic diseases, making the explanation valid.

- 34. Assertion (A) :** Scoliosis in adolescents is unlikely to be corrected solely by postural training and non-surgical interventions.

Reason (R) : Postural exercises have been proven to completely eliminate spinal curvature in adolescents with scoliosis.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

DELHI 2009

- (d) Both A and R are false

The assertion is true since scoliosis often requires interventions beyond postural training, yet the reason is false because postural exercises cannot fully eliminate spinal curvature in scoliosis. Both statements, as given, are incorrect regarding the management and outcomes of adolescent scoliosis.

- 35. Assertion (A) :** WHO guidelines recommend that older adults engage in moderate physical activity tailored to their abilities to maintain functional independence.

Reason (R) : Tailored physical activity in older adults helps reduce fall risk and enhances overall functional capacity.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

OD 2003

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is correct as WHO emphasizes customized physical activity for older adults. The reason accurately explains that such tailored exercise programs effectively reduce fall risk and improve functional capacity, making it the correct explanation for the recommended guidelines.

- 36.** For children and adolescents aged 5–17 years, WHO recommends at least _____ minutes of moderate to vigorous physical activity daily.

- (a) 30
 (b) 45
 (c) 60
 (d) 90

Ans :

FOREIGN 2012

- (c) 60

The WHO recommends that children and adolescents aged five to seventeen engage in at least sixty minutes of moderate to vigorous physical activity daily. This guideline supports overall health, enhances fitness, and reduces chronic disease risks, ensuring growth and development.

- 37.** For preschool children aged 3–4 years, WHO guidelines suggest accumulating at least _____ hours of physical activity throughout the day.

- (a) 1
 (b) 2
 (c) 3
 (d) 4

Ans :

SQP 2019

- (c) 3

WHO guidelines state that preschool children aged three to four years should accumulate at least three hours of physical activity throughout the day, including light, moderate, and vigorous activities, to support motor skill development and overall health benefits remarkably well.

- 38.** Which postural deformity is characterized by the inward angulation of the knees?

- (a) Bow legs
 (b) Knock knees
 (c) Kyphosis
 (d) Lordosis

Ans :

COMP 2020

- (b) Knock knees

Knock knees, medically known as genu valgum, is characterized by an inward angulation of the knees while standing. This condition can be corrected through targeted physiotherapy, strengthening exercises, and sometimes orthotic devices to achieve proper alignment.

39. A common corrective measure for flat foot deformity is the use of _____.

- (a) Surgical intervention
- (b) Orthotic insoles
- (c) Complete rest
- (d) Massage therapy

Ans :

DELHI 2006

- (b) Orthotic insoles

Flat foot deformity can be managed through the use of orthotic insoles, which provide arch support, combined with targeted exercises and proper footwear to alleviate discomfort and correct alignment over time, reducing pain effectively.

40. Which of the following is a physical benefit of women's participation in sports?

- (a) Reduced bone density
- (b) Increased sedentary behavior
- (c) Improved cardiovascular health
- (d) Heightened stress levels

Ans :

OD 2008

- (c) Improved cardiovascular health

Women's participation in sports enhances physical health by improving cardiovascular fitness, increasing muscular strength, and promoting better bone density. Regular physical activity helps reduce chronic disease risks, thereby contributing significantly to overall health and longevity.

41. A key psychological benefit for women participating in sports is _____.

- (a) Increased anxiety
- (b) Improved self-esteem
- (c) Enhanced isolation
- (d) Decreased mood

Ans :

FOREIGN 2005

- (b) Improved self-esteem

Participation in sports enhances women's psychological well-being by boosting self-esteem, reducing stress, and improving mood. The social environment and physical activity stimulate positive mental health, creating a sense of empowerment, confidence and resilience.

42. One social benefit of women's participation in sports is _____.

- (a) Social isolation
- (b) Enhanced community engagement
- (c) Reduced teamwork
- (d) Increased sedentary habits

Ans :

SQP 2014

- (b) Enhanced community engagement

Participation in sports fosters social benefits by enhancing community engagement, promoting teamwork, and facilitating meaningful interactions. This inclusive environment helps women build supportive networks, develop leadership skills, and experience a strong sense of belonging overall.

43. Regarding menarche, a special consideration for female athletes is that intense training may lead to _____.

- (a) Earlier menarche
- (b) Delayed menarche
- (c) No menstrual changes
- (d) Hypermenorrhea

Ans :

COMP 2001

- (b) Delayed menarche

Intense physical training in young female athletes can lead to delayed menarche due to hormonal imbalances and energy deficits. Monitoring menstrual health is crucial to ensure proper development and prevent long-term reproductive and metabolic issues effectively monitored.

44. Which of the following is NOT a component of the female athlete triad?

- (a) Osteoporosis
- (b) Amenorrhea
- (c) Eating disorders
- (d) Hyperthyroidism

Ans :

DELHI 2006

- (d) Hyperthyroidism

The female athlete triad comprises osteoporosis, amenorrhea, and eating disorders resulting from energy deficiency. Hyperthyroidism is a distinct endocrine disorder and not part of the triad, thereby clearly being excluded now.

45. For mild kyphosis in children, the recommended corrective measure is _____.

- (a) Bracing and surgery
- (b) Postural exercises and physiotherapy
- (c) Complete bed rest
- (d) High-intensity weight training

Ans :

OD 2011

- (b) Postural exercises and physiotherapy

Mild kyphosis in children is typically managed with postural correction exercises and physiotherapy. These non-invasive measures improve spinal alignment, strengthen back muscles, and reduce curvature, effectively minimizing discomfort and preventing further progression over time.

46. Participation in sports provides women with physical benefits. Which of the following is one of these benefits?

(a) Reduced cardiovascular health
(b) Increased bone density
(c) Decreased muscular strength
(d) Lower metabolic rate

Ans :

FOREIGN 2004

(b) Increased bone density

Women engaging in regular sports activities experience increased bone density due to weight-bearing exercises, which strengthen bones, reduce the risk of osteoporosis, and enhance overall physical stability. This benefit is critical for long-term health and fracture prevention.

47. Psychologically, participation in sports helps women improve their _____.

(a) Self-esteem
(b) Anxiety
(c) Isolation
(d) Depression

Ans :

SQP 2002

(a) Self-esteem

Regular participation in sports enhances women's psychological well-being by improving self-esteem and reducing anxiety. Engaging in physical activity provides a sense of accomplishment and empowerment, leading to improved mood, better stress management, and overall mental health benefits for daily life.

48. Socially, sports participation in women promotes _____.

(a) Isolation
(b) Individualism
(c) Community engagement
(d) Competitive aggression

Ans :

COMP 2013

(c) Community engagement

Social benefits of sports for women include enhanced community engagement. Participating in team sports fosters interaction, builds social networks, and encourages collaboration, which leads to improved interpersonal relationships and a stronger sense of belonging in various social environments indeed.

49. The female athlete triad comprises three components. Which of the following is NOT one of them?

(a) Osteoporosis
(b) Amenorrhea
(c) Eating disorders
(d) Hyperglycemia

Ans :

DELHI 2016

(d) Osteoporosis

The female athlete triad comprises osteoporosis, amenorrhea, and eating disorders. Hyperglycemia is not part of the triad because it relates to abnormal blood sugar levels, whereas the triad involves bone loss, menstrual dysfunction, and disordered eating indeed.

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50. Which of the following is a recommended corrective measure for round shoulders?

(a) Strengthening back muscles
(b) Increasing forward head posture
(c) Sedentary behavior
(d) Ignoring posture

Ans :

SQP 2009

(a) Strengthening back muscles

Corrective measures for round shoulders involve strengthening back muscles and improving posture through targeted exercises. Regular stretching, strengthening routines, and ergonomic adjustments help realign the shoulder girdle, reduce pain, and prevent further imbalance indeed.

51. Which corrective measure is often recommended for kyphosis in children?

(a) Bracing
(b) High-intensity exercise
(c) Postural exercises
(d) Ignoring symptoms

Ans :

COMP 2003

(c) Postural exercises

Kyphosis in children is often managed with postural exercises and physiotherapy. These non-invasive interventions help strengthen back muscles, improve spinal alignment, and reduce curvature. Consistent exercise routines with professional guidance contribute significantly to corrective outcomes indeed effectively.

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- 52.** Women's participation in sports provides multiple benefits. Which psychological benefit is highlighted?

(a) Decreased self-esteem
(b) Increased isolation
(c) Improved self-esteem
(d) Heightened anxiety

Ans :

DELHI 2012

(c) Improved self-esteem

Participation in sports significantly enhances psychological well-being by boosting self-esteem, reducing stress, and improving mood. The resulting mental resilience and confidence empower women to manage challenges effectively, thereby contributing to overall emotional and cognitive health and promoting life balance.

- 53.** What is one social benefit of women's sports participation?

(a) Reduced community engagement
(b) Enhanced social isolation
(c) Improved community engagement
(d) Increased individualism

Ans :

OD 2019

(c) Improved community engagement

Women's participation in sports fosters enhanced community engagement by promoting teamwork, social interaction, and mutual support. This collaborative environment enables the formation of robust social networks, strengthens interpersonal relationships, and builds a supportive community through regular physical activity indeed effectively.

- 54.** Which of the following is NOT part of the WHO exercise guidelines for children?

(a) 60 minutes per day
(b) Three hours per day for preschoolers
(c) 30 minutes per day for adolescents
(d) Varied intensities recommended

Ans :

FOREIGN 2020

(c) 30 minutes per day for adolescents

WHO exercise guidelines recommend sixty minutes daily for children and adolescents and three hours for preschoolers. Thirty minutes per day for adolescents is insufficient and does not meet the established standards necessary to promote optimal physical development and overall health.

- 55.** What is one recommended exercise for preventing postural deformities in children?

(a) Sedentary behavior
(b) Regular stretching
(c) Excessive screen time
(d) High-intensity weightlifting

Ans :

SQP 2006

(b) Regular stretching

Regular stretching exercises are recommended for children to prevent postural deformities by increasing flexibility, reducing muscle tightness, and promoting proper body alignment. Consistent practice helps maintain correct posture, minimizes skeletal issues, and encourages healthy physical development indeed.

- 56.** Which of the following conditions is part of the female athlete triad?

(a) Amenorrhea
(b) Hyperthyroidism
(c) Diabetes
(d) Hypertension

Ans :

SQP 2008

(a) Amenorrhea

Amenorrhea is a key component of the female athlete triad, which also includes osteoporosis and eating disorders. This condition reflects a disruption in menstrual cycles due to excessive physical exertion, energy deficiency, and hormonal imbalances commonly observed in female athletes.

- 57.** What is a common corrective measure for scoliosis in children?

(a) Bracing
(b) Ignoring symptoms
(c) Complete bed rest
(d) High-intensity exercise

Ans :

COMP 2005

(a) Bracing

Bracing is a common corrective measure for scoliosis in children, designed to prevent further spinal curvature progression. When combined with physiotherapy and regular monitoring, bracing helps maintain spinal alignment and reduces the risk of severe deformities developing over time indeed.

- 58.** Which exercise is especially recommended for strengthening the core muscles in female athletes?

(a) Yoga
(b) Weightlifting
(c) Running
(d) Swimming

Ans :

DELHI 2019

(a) Yoga

Yoga is highly recommended for female athletes as it improves core strength, flexibility, balance, and mental focus. Regular practice supports overall physical conditioning, helps prevent injuries, and contributes to enhanced performance and recovery while increasing overall endurance indeed.

59. What is a common cause of menstrual dysfunction in female athletes?

- (a) Excess energy intake
- (b) Overtraining
- (c) Sedentary lifestyle
- (d) Adequate rest

Ans :

OD 2001

(b) Overtraining

Overtraining in female athletes often leads to menstrual dysfunction due to energy deficits and hormonal imbalances. Excessive physical stress combined with insufficient recovery disrupts the normal menstrual cycle, resulting in irregular periods or amenorrhea while negatively impacting reproductive health overall.

60. Which exercise is beneficial for correcting bow legs in children?

- (a) Weightlifting
- (b) Stretching and strengthening exercises
- (c) Aerobic exercise only
- (d) No exercise is beneficial

Ans :

FOREIGN 2006

(b) Stretching and strengthening exercises

Stretching and strengthening exercises are beneficial for correcting bow legs in children. They target muscle imbalances and improve lower limb alignment by enhancing flexibility, promoting balanced muscular development, and supporting proper bone growth during critical developmental periods indeed.

61. Which of the following is an important social benefit of sports participation for women?

- (a) Isolation
- (b) Increased competitiveness
- (c) Enhanced community integration
- (d) Reduced interaction

Ans :

SQP 2011

(c) Enhanced community integration

Enhanced community integration is an important social benefit of women's sports participation. It fosters teamwork, builds strong social networks,

encourages cultural exchange, and promotes mutual support, thereby strengthening community bonds and contributing to a more inclusive social environment indeed.

62. What is a common cause of postural deformities in children?

- (a) Sedentary lifestyle
- (b) Excessive physical activity
- (c) Balanced nutrition
- (d) Regular exercise

Ans :

COMP 2014

(a) Sedentary lifestyle

A sedentary lifestyle is a common cause of postural deformities in children because prolonged inactivity leads to weak muscles and poor posture. Insufficient physical activity prevents proper muscle development, resulting in alignment issues and increased vulnerability to skeletal deformities indeed.

63. What effect does regular physical activity have on children's overall health?

- (a) Decreases physical fitness
- (b) Enhances growth and development
- (c) Leads to obesity
- (d) Reduces motor skills

Ans :

DELHI 2004

(b) Enhances growth and development

Regular physical activity enhances children's overall health by promoting growth and development, improving cardiovascular fitness, strengthening muscles, and boosting motor skills. Consistent exercise also contributes to better mental health and reduces the risk of childhood obesity, indeed improving overall.

64. Which factor is most important for preventing the female athlete triad?

- (a) Adequate nutrition
- (b) Excessive training
- (c) Low energy intake
- (d) Ignoring menstrual irregularities

Ans :

OD 2002

(a) Adequate nutrition

Adequate nutrition is crucial for preventing the female athlete triad, which comprises osteoporosis, amenorrhea, and eating disorders. A balanced diet ensures sufficient energy availability, supports hormonal balance, and maintains bone density, thereby reducing the risk of these interrelated health issues indeed.

65. Which intervention is recommended for managing menstrual dysfunction in female athletes?

- (a) Increased training
- (b) Nutritional counseling
- (c) Complete rest
- (d) Ignoring symptoms

Ans :

FOREIGN 2013

- (b) Nutritional counseling

Nutritional counseling is recommended for managing menstrual dysfunction in female athletes because it addresses energy deficits and supports hormonal balance. Proper dietary guidance helps restore regular menstrual cycles, improve overall health, and prevent long-term reproductive and metabolic complications indeed.

66. Minimum duration of activity should be _____ per week at vigorous intensity in adults above 65 years of age.

- (a) 75 minutes
- (b) 150 minutes
- (c) 300 minutes
- (d) 450 minutes

Ans :

SQP 2016

- (a) 75 minutes

According to widely accepted physical activity guidelines for older adults, vigorous intensity exercise is recommended at a minimum of 75 minutes weekly. This duration optimizes cardiovascular health and functioning while considering age-related recovery needs, balancing benefits with safety in populations.

67. Rate at which the activity is being performed is known as:

- (a) Volume
- (b) Intensity
- (c) Type of Activity
- (d) Frequency

Ans :

COMP 2017

- (b) Intensity

Intensity refers to the rate at which activity is performed. It measures how hard the exercise is relative to maximum capacity and determines the workload. Higher intensity usually results in greater energy expenditure and cardiovascular demands during the exercise session.

68. Deformity of the legs is known as

- (a) Scoliosis
- (b) Lordosis
- (c) Knock knees
- (d) Kyphosis

Ans :

DELHI 2007

- (c) Knock knees

Knock knees, medically known as genu valgum, is a condition where the knees angle inward causing the lower legs to deviate outward. This leg deformity alters alignment and gait, potentially impairing mobility and overall musculoskeletal function if untreated, affecting function.

69. Lordosis is a problem of the

- (a) Lower Back
- (b) Middle Back
- (c) Upper Back
- (d) Shoulders

Ans :

OD 2010

- (a) Lower Back

Lordosis is an excessive inward curvature of the spine, typically affecting the lumbar or lower back region. This condition may cause discomfort and posture issues, making it essential to maintain proper core strength and spinal alignment for management in daily.

70. Scoliosis is a postural deformity related to

- (a) Muscles
- (b) Shoulders
- (c) Legs
- (d) Spine

Ans :

FOREIGN 2015

- (d) Spine

Scoliosis is characterized by an abnormal lateral curvature of the spine. This condition alters the normal alignment, affecting overall posture and potentially leading to pain and functional limitations. Early detection and treatment are crucial to manage progression and complications effectively.

71. Kyphosis is a deformity found in

- (a) Shoulders
- (b) Lumbar region
- (c) Hips
- (d) Thoracic region

Ans :

SQP 2018

- (d) Thoracic region

Kyphosis involves an exaggerated forward curvature of the upper spine, particularly in the thoracic region. This postural abnormality can lead to pain, reduced mobility, and breathing difficulties if severe. Timely intervention and physical therapy may alleviate symptoms with proper care.

72. Sports is a important tool for social empowerment for women as it develops the folowing:

- (a) Aggression
- (b) Isolation
- (c) Stress
- (d) Leadership

Ans :

COMP 2017

- (d) Leadership

Sports empower women by fostering leadership skills, confidence, and teamwork. Participation in athletic activities cultivates decision-making, resilience, and public engagement. These qualities contribute to social empowerment, challenging traditional gender roles and promoting equality within various social and professional spheres effectively.

73. Psychological benefits of women participation in sports includes:

- (a) Coopration
- (b) Emotation Control
- (c) Physical Fitness
- (d) Communication

Ans :

DELHI 2009

- (b) Emotation Control

Participating in sports enhances psychological well-being by improving emotion control. Engaging in athletic activities reduces stress, builds self-confidence, and fosters discipline, enabling women to manage their emotional responses effectively and maintain mental balance in challenging situations through regular participation consistently.

74. Frequent menstruation is known as:

- (a) Metrorrhagia
- (b) Oligomenorrhea
- (c) Polymenorrhea
- (d) Menorrhagia

Ans :

OD 2006

- (c) Polymenorrhea

Polymenorrhea describes frequent menstrual cycles occurring at intervals shorter than normal. It is characterized by regular, heavy menstrual bleeding occurring more often than the typical cycle length. This condition may indicate underlying hormonal imbalances requiring medical evaluation, warranting further assessment.

75. If the menstruation cycle does not begin at puberty, the condition is called

- (a) Primary amenorrhea
- (b) Secondary amenorrhea
- (c) Oligomenorrhea
- (d) Dysmenorrhea

Ans :

FOREIGN 2001

- (a) Primary amenorrhea

Primary amenorrhea refers to the absence of menstruation by the age of expected onset during puberty. It indicates that the menstrual cycle has not started naturally. This condition requires evaluation for potential hormonal or anatomical abnormalities to determine appropriate management.

76. Weakening of bones due to loss of bone density and improper bone formation is

- (a) Amenorrhea
- (b) Anorexia Nervosa
- (c) Osteoporosis
- (d) Lordosis

Ans :

SQP 2004

- (c) Osteoporosis

Osteoporosis is characterized by weakened bones resulting from decreased bone density and improper bone formation. This condition increases fracture risk, especially in older individuals. Preventative measures include proper nutrition, weight-bearing exercises, and ensuring adequate calcium and vitamin D intake, significantly.

77. What is the cause of Osteoporosis in women?

- (a) High blood pressure
- (b) Menarche
- (c) Excessive exercise
- (d) Lack of calcium and vitamin D

Ans :

COM 2007

- (d) Lack of calcium and vitamin D

In women, osteoporosis is commonly caused by insufficient intake of calcium and vitamin D, essential nutrients for bone health. Hormonal changes during menopause further contribute to decreased bone density, making adequate nutritional support critical for prevention and management in women.

78. Female athlete triad is a syndrome characterized by

- (a) Osteoporosis
- (b) Amenorrhea
- (c) Eating disorder
- (d) All of the above

Ans :

DELHI 2003

(d) All of the above

The female athlete triad encompasses a combination of disordered eating, amenorrhea, and osteoporosis. This syndrome affects active women and highlights the importance of balanced nutrition, proper training, and health monitoring to prevent long-term complications, ensuring overall physical and mental wellness.

79. In which type of Anorexia does an individual lose weight by taking laxatives or diuretics

- (a) Bulimia Nervosa
- (b) Purging type
- (c) Restricting type
- (d) Anorexia Nervosa

Ans :

OD 2008

(d) Anorexia Nervosa

The female athlete triad encompasses a combination of disordered eating, amenorrhea, and osteoporosis. This syndrome affects active women and highlights the importance of balanced nutrition, proper training, and health monitoring to prevent long-term complications, ensuring overall physical and mental wellness.

80. Look at the figure provided and select the postural defect that it most clearly illustrates:



- (a) Scoliosis
- (b) Flat Back
- (c) Rounded Shoulders
- (d) Forward Head Posture

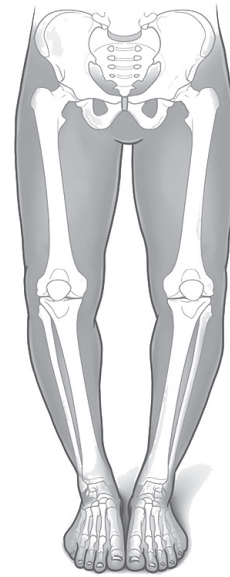
Ans :

FOREIGN 2006

(c) Rounded Shoulders

The figure shows a forward rounding of the upper back, where the shoulders are protracted (moved forward) and the scapulae are not held in a neutral retracted position. This is typically referred to as “rounded shoulders.”

81. Look at the figure provided. Which of the following best describes the knee alignment (postural defect) shown?



- (a) Genu Varum (Bow Legs)
- (b) Genu Valgum (Knock Knees)
- (c) Genu Recurvatum (Hyperextended Knees)
- (d) Normal Knee Alignment

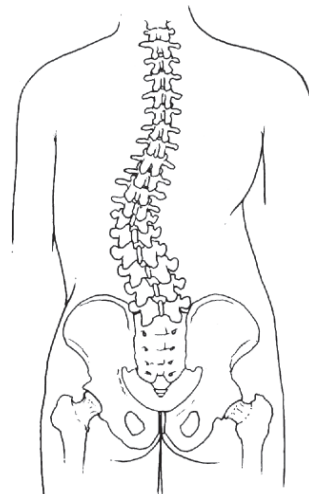
Ans :

SQP 2002

(a) Genu Varum (Bow Legs)

In genu varum, the legs bow outward so that when the ankles are together, there is a noticeable gap between the knees. This creates a “bow-legged” appearance, as shown in the figure.

82. Look at the figure provided. Which of the following best describes the spinal alignment (postural defect) shown?



- (a) Scoliosis
- (b) Lordosis
- (c) Kyphosis
- (d) Normal Spinal Curvature

Ans :

COMP 2010

- (a) Scoliosis

Scoliosis is a lateral curvature of the spine. From the posterior view, the spine deviates from the midline, creating a characteristic “S” or “C” shape, as illustrated in the figure.

83. Look at the figure provided. Which of the following best describes the postural defect shown from the side view?



- (a) Lordosis
- (b) Kyphosis
- (c) Scoliosis
- (d) Normal Spinal Alignment

Ans :

DELHI 2012

- (a) Lordosis

Lordosis is characterized by an exaggerated inward curvature of the lumbar (lower) spine, often giving the appearance of the abdomen and buttocks protruding out.

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84. Look at the figure provided. Which of the following best describes the knee alignment (postural defect) shown?



- (a) Genu Varum (Bow Legs)
- (b) Genu Valgum (Knock Knees)
- (c) Genu Recurvatum (Hyperextended Knees)
- (d) Normal Knee Alignment

Ans :

OD 2015

- (b) Genu Valgum (Knock Knees)

Genu valgum, commonly referred to as “knock knees,” is characterized by the knees being closer together and the lower legs angled outward. When the knees touch, there is a noticeable gap between the ankles.

TWO MARKS QUESTIONS

85. Suggest physical exercises for childhood and adulthood.

Ans :

SQP 2020

1. Childhood:
 - i. Vigorous Activities: Running or playing soccer.
 - ii. Muscle Strengthening: Climbing or performing push-ups.
 - iii. Bone Strengthening: Gymnastics or jumping rope.
2. Adulthood:
 - i. Moderate-Intensity Exercise: At least 150

minutes per week of activities like brisk walking.

- ii. Balance Improvement: Standing on one foot.
- iii. Muscle Strengthening: Push-ups.

86. What is the main cause of 'Scoliosis'?

Ans :

COMP 2018

Scoliosis is a condition affecting the bones and joints, characterized by an abnormal sideways curvature of the spine. It can result from poor posture, muscle weakness or paralysis, diseases like tuberculosis (TB) or rickets, heavy lifting, or hereditary factors.

87. State the common postural deformities.

Ans :

AI 2017

Common Postural Deformities:

1. Kyphosis : Excessive outward curvature of the upper spine, leading to a hunched back.
2. Lordosis : Excessive inward curvature of the lower spine, causing the abdomen to protrude.
3. Scoliosis : Sideways curvature of the spine, forming an "S" or "C" shape.
4. Knock Knees : Knees touch while standing with feet apart, affecting leg alignment.
5. Bow Legs : Legs curve outward, preventing the knees from touching when standing straight.
6. Flat Foot : Absence of the natural arch in the foot, leading to discomfort and instability.

88. Suggest two exercises for correcting flat foot.

Ans :

Delhi 2016

Two Exercises to Correct Flat Foot:

1. Toe Raises (Arch Strengthening Exercise) : Stand barefoot and slowly raise your heels while keeping your toes on the ground. Hold for a few seconds and lower back down. Repeat 10–15 times to strengthen the foot arch.
2. Towel Curl Exercise : Place a towel on the floor and use your toes to scrunch it toward you. This helps improve arch strength and flexibility. Repeat for 10–15 repetitions per foot.

89. Write a short note on 'Menarche'.

Ans :

2024

Menarche is the first occurrence of menstruation in a female, marking the onset of puberty. It typically happens between 10 to 15 years of age and signals reproductive maturity. Influenced by

genetics, nutrition, and overall health, menarche leads to hormonal changes, initiating the menstrual cycle.

90. What is 'Amenorrhea' in female athlete triad?

Ans :

DELHI 2018

Amenorrhea refers to the absence of menstruation in female athletes, a key component of the Female Athlete Triad—a condition involving disordered eating, menstrual dysfunction, and low bone density. It occurs due to excessive exercise, low energy availability, and hormonal imbalances, leading to irregular or missed periods. This can increase the risk of osteoporosis and other health complications.

91. What is Female Athlete Triad?

Ans :

Delhi 2016 C

Female Athlete Triad : The Female Athlete Triad is a medical condition that affects female athletes due to excessive physical activity and inadequate nutrition. It consists of three interrelated health issues:

1. Disordered Eating or Inadequate Nutrition : Insufficient calorie intake affects energy levels and overall health.
2. Menstrual Dysfunction (Amenorrhea) : Irregular or absent menstrual cycles due to hormonal imbalances.
3. Low Bone Density (Osteoporosis) : Weakened bones, increasing the risk of fractures and injuries.

This condition can lead to fatigue, frequent injuries, reduced performance, and long-term health complications if untreated..

92. What are the causes of Osteoporosis?

Ans :

AI 2019

Causes of Osteoporosis

1. Hormonal Imbalance : Low estrogen in women (post-menopause) and low testosterone in men contribute to bone loss.
2. Nutritional Deficiencies : Inadequate calcium, vitamin D, and protein intake weakens bones.
3. Lack of Physical Activity : A sedentary lifestyle or lack of weight-bearing exercises reduces bone strength.
4. Medical Conditions & Medications : Diseases like hyperthyroidism, rheumatoid arthritis, and prolonged corticosteroid use can lead to bone loss.
5. Genetic Factors : Family history of

osteoporosis increases susceptibility.

6. Smoking & Alcohol Consumption : These habits interfere with bone formation and calcium absorption.
7. Low Body Weight & Eating Disorders : Conditions like anorexia reduce bone mass.

- 93.** Suggest any four ways through which women participation in sports across age group can be enhanced.

Ans :

Delhi 2015

Ways to Increase Women's Participation in Sports

1. Overcoming Physical and Physiological Barriers : Ensuring proper training and addressing biological constraints.
2. Eliminating Psychological Barriers : Reducing anxiety, controlling aggression, and promoting confidence in sports.
3. Addressing Economic Challenges : Allocating funds for sports facilities in schools and colleges for female athletes.
4. Enhancing Public Interest : Increasing media coverage and sponsorship for women's sports to boost visibility and encouragement.

- 94.** Comment on the outlook of Indian society towards the participation of women in sports.

Ans :

Delhi 2019

Perception of Women in Sports in Indian Society

1. Male-Dominated Field : Sports is traditionally seen as an area dominated by men.
2. Social Restrictions : Women are often discouraged from participating in sports due to societal norms.
3. Safety Concerns : Personal safety on roads, public transport, and sports venues remains a major challenge.
4. Physical and Health Misconceptions : Vigorous physical activity is wrongly believed to impact a woman's physique and fertility.

- 95.** How can women's participation in sports and games be encouraged in India? Explain.

Ans :

AI 2017

Ways to Enhance Women's Participation in Sports

1. Eliminating Physical and Physiological Barriers : Addressing biological constraints and ensuring proper training.
2. Overcoming Psychological Challenges : Reducing anxiety, managing aggression, and fostering confidence in female athletes.

3. Addressing Economic Barriers : Allocating budgets for sports infrastructure in schools and colleges for girls.
4. Boosting Public Engagement : Increasing media coverage and sponsorship to promote women's sports and encourage participation.

- 96.** State any two exercise guidelines by WHO for children and adolescents, and explain why they are important.

Ans :

DELHI 2011

1. At least 60 minutes of daily physical activity: The WHO recommends that children and adolescents (5:17 years) engage in at least one hour of moderate-to-vigorous physical activity daily. This helps in building healthy bones and muscles, maintaining a healthy weight, and improving cardiovascular fitness.
2. Focus on aerobic exercises and strengthening activities: Within those 60 minutes, activities that strengthen muscles and bones should be included at least three times a week. This ensures balanced development and helps reduce the risk of chronic diseases later in life.

- 97.** Define the term postural deformities and list any two examples.

Ans :

OD 2013

Postural deformities refer to incorrect or abnormal alignments of the body's structure, often affecting the spine, knees, or feet. These deformities can result from factors such as poor posture habits, muscle imbalances, or genetic predispositions.

Examples:

1. Knock Knees (Genu Valgum) : The knees angle in and touch each other when standing straight.
2. Flat Foot (Pes Planus) : The arches of the feet are lower than normal or completely collapsed.

- 98.** Explain one psychological benefit of women's participation in sports.

Ans :

FOREIGN 2015

Enhanced Self-esteem and Confidence: Engaging in sports allows women to set goals, face challenges, and experience accomplishments, all of which boost self-confidence. Regular participation also fosters a sense of competence and resilience that can positively influence other areas of life, such as academics or career pursuits.

- 99.** What is menarche, and why is it significant in the context of female athletes?

Ans :

SQP 2019

Menarche is the onset of the first menstrual cycle in females, typically occurring between 10 and 15 years of age.

Significance : For female athletes, menarche indicates the beginning of reproductive maturity and can influence factors like energy levels, body composition, and hormonal balance. Coaches and trainers need to be aware of this developmental stage to provide appropriate training loads and nutritional guidance to maintain overall health and performance.

- 100.** Define the Female Athlete Triad and name its three components.

Ans :

COMP 2014

The Female Athlete Triad is a syndrome commonly seen in physically active women, characterized by three interrelated conditions that can severely impact health and performance.

Components:

1. Disordered Eating (or low energy availability)
2. Amenorrhea (irregular or absent menstrual periods)
3. Osteoporosis (reduced bone density and increased fracture risk)

- 101.** Describe two WHO exercise guidelines for adults (18–64 years) and discuss one benefit.

Ans :

DELHI 2016

1. 150–300 minutes of moderate-intensity aerobic activity per week: This helps in maintaining cardiovascular health, managing weight, and reducing the risk of lifestyle diseases such as diabetes and hypertension.
2. Muscle-strengthening activities at least twice a week: Resistance exercises like weight training or bodyweight exercises support muscular strength, bone density, and overall functional fitness.
3. Benefit: Regular exercise in adulthood can significantly lower the risk of heart disease and improve mental well-being, contributing to a better quality of life.

- 102.** What is kyphosis, and mention one corrective measure for it.

Ans :

OD 2018

Kyphosis is a postural deformity characterized

by an excessive outward curvature of the thoracic spine, leading to a rounded upper back or “hunchback” appearance.

Corrective Measure: Strengthening exercises targeting the upper back and scapular muscles (e.g., rows, scapular retractions) combined with stretches for the chest and anterior shoulder muscles can help improve spinal alignment and reduce the rounded shoulder posture.

- 103.** Highlight one physical benefit of women’s participation in sports.

Ans :

FOREIGN 2020

Improved Musculoskeletal Health: Regular sports participation helps women develop stronger muscles and bones, reducing the risk of osteoporosis and other bone-related issues. Weight-bearing activities, in particular, are beneficial for maintaining bone density, which is crucial for preventing fractures later in life.

- 104.** Discuss menstrual dysfunction in female athletes and its potential impact on performance.

Ans :

SQP 2007

Menstrual dysfunction includes conditions such as irregular cycles or complete cessation of menstruation (amenorrhea). It can arise from inadequate calorie intake, excessive training loads, and stress.

Impact : Prolonged menstrual dysfunction can lead to hormonal imbalances, decreased bone density, increased injury risk, and reduced overall energy levels, which ultimately hampers both short-term performance and long-term health.

- 105.** Explain how osteoporosis can develop in the context of the Female Athlete Triad.

Ans :

COMP 2003

1. **Process:** When energy intake is consistently too low, the body conserves resources by altering hormone production. Low estrogen levels contribute to decreased bone mineral density, making bones weaker over time.
2. **Outcome:** This can result in osteoporosis, a condition where bones become brittle and prone to fractures, significantly affecting an athlete’s ability to train and compete safely.

- 106.** Why does the WHO emphasize regular physical activity for older adults (65+ years)?

Ans :

DELHI 2008

Engaging in regular physical activity helps maintain mobility, muscle strength, and balance, reducing the risk of falls and fractures. It also supports cardiovascular health and mental well-being, allowing older adults to preserve independence and improve their overall quality of life.

- 107.** Describe scoliosis and suggest one preventive or corrective approach.

Ans :

OD 2006

Scoliosis is a lateral curvature of the spine, often presenting as an “S” or “C” shape when viewed from the back.

Approach : Early detection through regular screenings is crucial. Physical therapy exercises, such as spinal stabilization and core strengthening routines, can help correct mild curvatures. In more severe cases, bracing or surgical intervention may be required to prevent further curvature progression.

- 108.** Discuss one social benefit that women gain from participating in sports.

Ans :

FOREIGN 2002

Enhanced Social Networking: Participating in sports teams or community events allows women to connect with others, develop friendships, and foster a sense of belonging. This social interaction can lead to improved communication skills, support networks, and greater involvement in community initiatives, all of which contribute positively to mental and emotional well-being.

- 109.** What special considerations should be taken during menarche for young female athletes?

Ans :

SQP 2010

- 1. Training Adjustments:** Coaches should be mindful of fluctuating energy levels and potential discomfort during early menstrual cycles. Adjusting training intensity and ensuring adequate rest can help young athletes cope with these changes.
- 2. Nutritional Support:** Ensuring sufficient intake of iron, calcium, and other vital nutrients is critical to support healthy growth, hormonal balance, and prevent deficiencies that could affect performance and well-being.

- 110.** How does amenorrhea affect bone health in female athletes?

Ans :

COMP 2012

- 1. Mechanism:** Amenorrhea often results from low estrogen levels due to insufficient calorie intake, excessive exercise, or stress. Estrogen is essential for bone remodeling and maintenance.
- 2. Consequence:** Prolonged amenorrhea can lead to reduced bone density, increasing the likelihood of stress fractures and long-term conditions like osteopenia or osteoporosis, thereby compromising athletic performance and overall health.

- 111.** Summarize one WHO guideline for pregnant women or postpartum women regarding physical activity.

Ans :

DELHI 2015

The WHO recommends at least 150 minutes of moderate-intensity aerobic physical activity per week during pregnancy and postpartum, provided there are no medical contraindications. This may include low-impact exercises like brisk walking, swimming, or prenatal yoga. It supports healthy weight management, reduces the risk of gestational diabetes, and improves mental well-being.

- 112.** Define bow legs (Genu Varum) and suggest a simple exercise to help correct it.

Ans :

OD 2011

Bow legs is a condition where a person's legs curve outward, creating a gap between the knees when standing with feet together.

Side-lying leg raises and inner thigh strengthening can help balance muscle development around the knees. Maintaining proper alignment during standing and walking, along with regular stretching of tight muscles, can also aid in correction.

- 113.** Elaborate on one psychological challenge women might face in sports and how it can be addressed.

Ans :

FOREIGN 2013

- 1. Challenge:** Body image issues and societal expectations can create additional pressure on female athletes, affecting self-esteem and performance.
- 2. Solution:** Providing access to sports psychologists, supportive coaching environments, and educational programs on healthy body image can help women build resilience and maintain a positive mindset, thereby enhancing both mental health and athletic performance.

- 114.** Explain how menstrual dysfunction can be prevented in female athletes.

Ans :

SQP 2015

1. Adequate Nutrition: Ensuring a balanced diet with sufficient caloric intake to meet energy demands is crucial.
2. Balanced Training Programs: Avoiding overtraining and allowing adequate rest and recovery helps maintain hormonal balance.
3. Regular Health Check-ups: Monitoring menstrual cycles and consulting healthcare professionals early can prevent or mitigate menstrual irregularities.

- 115.** How do eating disorders within the Female Athlete Triad impact overall athletic performance?

Ans :

COMP 2019

Eating disorders like anorexia nervosa or bulimia nervosa lead to inadequate nutrient intake, reduced energy levels, and potentially dangerous electrolyte imbalances. This not only weakens muscles and reduces stamina but also impairs concentration and decision-making on the field. Long-term, it increases the risk of injury, illness, and can derail an athlete's career if not addressed promptly.

THREE MARKS QUESTIONS

- 116.** What is Lordosis? Explain.

Ans :

Delhi 2017

Lordosis (Swayback): Lordosis, also known as swayback, is a condition where the lower spine curves excessively inward.

1. Symptoms of Lordosis :
 - i. Pronounced Buttocks : Individuals with lordosis have a noticeable swayback posture.
 - ii. Lower Back Arching : A significant gap between the lower back and the floor when lying flat, which remains unchanged when bending forward.
 - iii. Back Pain and Discomfort : Persistent pain due to abnormal spinal curvature.
 - iv. Restricted Movement : Difficulty in certain motions due to spinal misalignment.
2. Causes of Lordosis:
 - i. Achondroplasia : A genetic disorder

causing short stature due to abnormal bone growth.

- ii. Spondylolisthesis : A vertebra slips forward, often in the lower back.
- iii. Osteoporosis : Fragile vertebrae leading to compression fractures.
- iv. Obesity : Excess body weight increasing spinal strain.
- v. Kyphosis : An exaggerated upper back curve that affects posture.
- vi. Discitis : Inflammation between spinal discs, often due to infection.

- 117.** Among females, what type of Menstrual Dysfunction is called Amenorrhea?

Ans :

AI 2019

Amenorrhea : Amenorrhea is the absence of menstrual periods for more than six months. It can occur due to significant weight loss, disordered eating, or intense physical training. A certain amount of body fat is essential for maintaining overall health. If a girl's nutrition is imbalanced and her weight drops to an unhealthy level, menstruation may stop. Maintaining a healthy weight is crucial, as it helps the body produce sufficient estrogen, the female hormone responsible for calcium absorption, which is vital for strong bones. Low estrogen levels can result in reduced bone density, increasing the risk of osteoporosis.

Types of Amenorrhea:

1. Primary Amenorrhea : Delayed onset of the first menstrual period (menarche), often accompanied by an absence of secondary sex characteristics. This condition typically requires medical intervention.
2. Secondary Amenorrhea : When a woman with a previously normal menstrual cycle stops menstruating for more than three consecutive cycles, it is classified as secondary amenorrhea.

- 118.** Write in brief the corrective measures of bow leg, knock-knee and flat foot.

Ans :

2023-24

Corrective Measures for Postural Deformities

1. Bow Legs:
 - i. Engage in leg-strengthening exercises like squats, lunges, and resistance band exercises to improve muscle support and alignment.

- ii. Horse riding is beneficial as it helps strengthen the inner thigh muscles and correct the outward curvature of the legs.
 - iii. In severe cases, braces, orthotic support, or medical intervention may be necessary to realign the legs properly.
2. Knock-Knee:
- i. Horse riding helps strengthen the thigh abductors, reducing inward knee bending.
 - ii. Perform side leg raises, butterfly stretches, and resistance band exercises to correct knee alignment.
 - iii. Use corrective footwear, braces, or physical therapy to support knee positioning and improve posture.
 - iv. In extreme cases, surgical correction may be recommended.
3. Flat Foot:
- i. Perform toe raises, towel curl exercises, and arch lifts to strengthen the foot arch and enhance flexibility.
 - ii. Walking barefoot on sand helps improve natural arch formation and strengthens foot muscles.
 - iii. Use arch-supporting footwear, orthotics, or insoles to provide adequate support and reduce discomfort.
 - iv. In persistent cases, physical therapy or medical intervention may be required.

119. Explain briefly about eating disorder “BULIMIA”.

Ans :

AI 2019

Bulimia is a severe eating disorder, primarily affecting adolescent girls and young women, where an individual consumes excessive food and then attempts to prevent weight gain. This is often done by inducing vomiting or adopting extreme weight-control measures. Those suffering from bulimia experience a loss of self-control, inadequate nutrition, and an unhealthy relationship with food.

1. Types of Bulimia:
 - i. Purging Type : The individual self-induces vomiting to expel consumed food.
 - ii. Non-Purging Type : The person engages in severe fasting, rigid dieting, or excessive exercise to prevent weight gain.
2. Causes of Bulimia:
 - i. Performance Pressure in Sports : Common in disciplines like gymnastics and marathons, where weight impacts performance.

- ii. Social Influences : Societal expectations and media portrayal of ideal body image.
- iii. Weight Category in Sports : Athletes often try to maintain a specific weight class.
- iv. Genetic Predisposition : A family history of eating disorders may increase risk.
- v. Psychological Factors : Issues like low self-esteem, anxiety, or perfectionism contribute to the disorder.

120. Write briefly about the prevention and management of “Anorexia”.

Ans :

AI 2019

1. Prevention Measures:
 - i. Promote a Positive Self-Image : Encourage a healthy perception of oneself and others by avoiding body-shaming comments.
 - ii. Educate About Genetics and Body Diversity : Help children understand that body shape and size are influenced by genetics.
 - iii. Encourage Healthy Eating and Physical Activity : Emphasize balanced nutrition and regular exercise for overall well-being.
 - iv. Avoid Triggers : Stay away from environments, people, or activities that promote unhealthy body standards or eating behaviors.
2. Management Strategies:
 - i. Acknowledge the Condition : Accepting and addressing the issue is the first step toward recovery.
 - ii. Restore a Healthy Weight : Ensure proper nutrition and gradual weight gain under medical supervision.
 - iii. Individual Psychotherapy : Counseling helps address emotional and psychological factors contributing to anorexia.
 - iv. Medication Support : Antidepressants may be prescribed to assist in the recovery process.

121. Write short note on Female Athlete Triad.

Ans :

2024

Female Athlete Triad : The Female Athlete Triad is a condition affecting young female athletes, characterized by the interconnection of menstrual dysfunction, low energy availability, and reduced bone mineral density. It is commonly observed in women engaged in sports and involves three key health concerns:

1. Inadequate Nutrition (Eating Disorders) : Insufficient calorie intake leading to energy deficiency.
2. Irregular Menstrual Cycles (Amenorrhea) : Disruptions in menstruation due to hormonal imbalance.
3. Low Bone Mass (Osteoporosis) : Weakened bones increasing the risk of fractures.

The primary treatment goal is to restore natural menstrual cycles and improve bone mineral density for long-term health and athletic performance.

- 122.** Explain the causes and corrective measures for knock-knee and scoliosis.

Ans :

Delhi 2019

1. Causes of Knock-Knee:
 - i. Improper Posture : Faulty standing habits lead to misalignment of the knees.
 - ii. Rickets and Nutritional Deficiencies : Lack of vitamin D, calcium, and phosphorus weakens bones.
 - iii. Obesity : Excess weight puts strain on the knee joints, leading to improper alignment.
 - iv. Muscle and Ligament Weakness : Weak supporting structures in the knee region contribute to the condition.
 - v. Improper Footwear : Wearing incorrect shoes affects lower body posture.
 - vi. Heavy Loads at an Early Age : Carrying excessive weight before bone development is complete can lead to misalignment.
2. Corrective Measures for Knock-Knee:
 - i. Horse Riding : Strengthens thigh muscles, improving knee alignment.
 - ii. Yoga Poses (Padmasana, Gomukhasana) : Help in improving flexibility and posture.
 - iii. Pillow Technique : Placing a pillow between the knees while standing helps train proper knee positioning.
 - iv. Walking Calipers : Used in severe cases to support knee alignment.
 - v. Straight Line Walking : Encourages outward-facing knee positioning for proper leg alignment.
 - vi. Side Kicking in Football : Strengthens leg muscles and corrects posture.
 - vii. Nutritional Supplements : As prescribed by doctors to strengthen bones.
3. Causes of Scoliosis:
 - i. Uneven Muscle Strength : Weakness in spinal muscles on one side can cause curvature.

- ii. Infantile Paralysis and Rickets : Conditions like polio and rickets affect spinal development.
 - iii. Carrying Heavy Loads : Uneven shoulder weight distribution may lead to spinal curvature.
 - iv. Medical Conditions : Diseases like cerebral palsy can contribute to scoliosis.
 - v. Poor Lighting Conditions : Can lead to improper sitting posture, affecting spinal alignment.
 - vi. Incorrect Sitting Habits : Slouching or sitting unevenly over time can impact spine structure.
 - vii. Partial Deafness : Can cause an imbalanced posture leading to spinal misalignment.
 - viii. Congenital or Acquired Spinal Abnormalities : Some individuals are born with vertebral deformities.
4. Corrective Measures for Scoliosis:
 - i. Breaststroke in Swimming : Strengthens back muscles and improves posture.
 - ii. Pull-Ups / Hanging from a Horizontal Bar : Helps stretch and align the spine.
 - iii. Opposite-Side Bending Exercises : Strengthens muscles on the concave side of the "C" curve.
 - iv. Spinal Flexion, Extension, and Sideward Bends : Improves flexibility and spinal alignment.
 - v. Any Other Relevant Corrective Exercises : Designed to improve posture and muscular balance.

- 123.** Explain 'Flat foot' and 'Knock knees' and also suggest corrective measures for both postural deformities.

Ans :

AI 2019

1. Flat Foot: Flat foot is a foot deformity where the natural arch is absent, making the entire foot rest flat on the ground. This condition may cause pain and discomfort, affecting an individual's ability to stand, walk, jump, or run efficiently.
- Corrective Measures for Flat Foot:
- i. Jumping on Toes : Helps strengthen foot muscles and develop the arch.
 - ii. Rope Skipping : Enhances foot coordination and promotes arch formation.
 - iii. Walking on Toes : Strengthens foot muscles, improving posture and balance.

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- iv. Heel Raises (Standing Up and Down on Heels) : Strengthens the foot arch.
 - v. Walking on Heels : Helps in correcting foot alignment.
 - vi. Inner and Outer Foot Walking : Improves flexibility and strengthens foot muscles.
 - vii. Vajrasana and Other Yogic Exercises : Improve foot flexibility and muscle tone.
2. Knock-Knee : Knock-knee is a postural deformity where the knees touch or overlap when standing in a normal position. This misalignment can lead to difficulty in walking and reduced mobility.
- Corrective Measures for Knock-Knee:
- i. Horse Riding : Strengthens thigh muscles and improves knee alignment.
 - ii. Pillow Technique : Keeping a pillow between the knees and standing for some time daily helps correct knee positioning.
 - iii. Walking Calipers : Beneficial in severe cases to support proper knee alignment.
 - iv. Yoga Poses (Padmasana, Gomukhasana) : Improve flexibility and posture, aiding in knee correction.

- 124.** What do you understand by round shoulders deformity? Suggest any four corrective measures for round shoulders.

Ans :

2023

Rounded shoulders refer to a postural issue where the shoulder girdle is positioned forward beyond its normal alignment, often accompanied by thoracic kyphosis (forward bending of the upper back). This misalignment occurs when the shoulders rest in a forward posture, deviating from their ideal position.

Corrective Measures for Rounded Shoulders:

- i. Doorway Chest and Shoulder Stretch : Helps correct posture and relieves upper back tension.
- ii. Stretching with One Arm at a Time : Perform the stretch separately on each arm for balanced improvement.
- iii. Stretching with Both Arms Together : Enhances flexibility and posture correction.
- iv. Half Bhujangasana and Bhujangasana : Strengthen the back and open the chest.
- v. Chakrasana and Dhanurasana : Improve spinal flexibility and posture.
- vi. Shoulder Rotations : Place fingertips on shoulders and rotate elbows in clockwise and counterclockwise directions to enhance shoulder mobility.

- 125.** Outline the WHO exercise guidelines for different age groups. Explain how these recommendations differ for children, adolescents, and adults.

Ans :

OD 2014

The WHO exercise guidelines provide tailored recommendations to promote health and development across different age groups:

1. Children (5-17 years):
 - i. Activity Level: At least 60 minutes of moderate-to-vigorous physical activity daily.
 - ii. Focus: Activities that strengthen muscles and bones at least 3 days a week.
 - iii. Benefits: Supports growth, improves motor skills, and reduces the risk of obesity.
 - iv. Adolescents (10-17 years, overlapping with children):
 - v. Activity Level: Similar to children, with an emphasis on activities that enhance cardiovascular fitness and muscular strength.
 - vi. Focus: Inclusion of varied activities, such as team sports and recreational play.
2. Adults (18-64 years):
 - i. Activity Level: At least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic physical activity per week.
 - ii. Focus: Muscle-strengthening activities on 2 or more days per week.
 - iii. Benefits: Reduces chronic disease risk, maintains functional capacity, and improves overall well-being.

- 126.** Identify three common postural deformities in children and briefly describe their characteristics along with one corrective measure for each.

Ans :

FOREIGN 2016

Three common postural deformities among children include:

1. Knock Knees (Genu Valgum):
 - i. Characteristics: The knees angle in and touch each other when the legs are straightened, while the ankles remain apart.
 - ii. Corrective Measure: Regular stretching and strengthening exercises for the inner thigh muscles and guidance from a physical therapist; in some cases, corrective braces may be recommended.

2. Round Shoulders:
 - i. Characteristics: The shoulders slouch forward, causing a hunched upper back appearance.
 - ii. Corrective Measure: Postural training and strengthening exercises for the back muscles (such as scapular retraction exercises) to promote a more upright posture.
3. Flat Foot (Pes Planus):
 - i. Characteristics: A condition where the arch of the foot is flattened, allowing the entire sole to touch the floor.
 - ii. Corrective Measure: Use of orthotic inserts to support the arch and targeted exercises to strengthen the foot muscles.

127. Discuss the physical, psychological, and social benefits of women's participation in sports.

Ans :

SQP 2019

Women's participation in sports brings a range of benefits across multiple dimensions:

1. Physical Benefits:
 - i. Fitness & Health: Regular physical activity improves cardiovascular health, enhances muscle strength, and contributes to maintaining a healthy weight.
 - ii. Injury Prevention: Strength training and flexibility exercises reduce the risk of injuries and improve overall physical resilience.
2. Psychological Benefits:
 - i. Mental Health: Sports participation reduces stress, anxiety, and depression by releasing endorphins, which improve mood and overall mental well-being.
 - ii. Self-Esteem & Confidence: Engaging in sports challenges individuals, builds self-confidence, and fosters a positive body image.
3. Social Benefits:
 - i. Community and Networking: Sports create opportunities for social interaction, building friendships, and enhancing team spirit.
 - ii. Empowerment: Participation promotes equality and empowerment, providing women with leadership opportunities and a platform to challenge societal norms.

128. Explain the special considerations for women in sports regarding menarche and menstrual dysfunction. How do these factors influence training and performance?

Ans :

COMP 2020

Special considerations for women in sports related to menarche (the onset of menstruation) and menstrual dysfunction are crucial for optimal performance and health:

1. Menarche Considerations:
 - i. Physical Changes: The onset of menstruation signals hormonal changes that can affect muscle mass, endurance, and recovery.
 - ii. Training Adaptation: Coaches need to adjust training loads to accommodate these changes, ensuring that young female athletes build strength and endurance gradually.
2. Menstrual Dysfunction:
 - i. Common Issues: Irregular cycles, heavy bleeding, or amenorrhea (absence of menstruation) can affect energy levels and concentration.
 - ii. Impact on Performance: These dysfunctions may lead to decreased performance, increased fatigue, and potential long-term health issues such as bone density loss.
3. Management Strategies:
 - i. Monitoring and Support: Regular health check-ups, nutritional guidance, and individualized training programs can help manage symptoms.
 - ii. Education and Communication: Open communication between athletes, coaches, and health professionals ensures that training is modified appropriately to maintain health and performance.

129. Define the female athlete triad and discuss its three main components. How can these conditions affect an athlete's performance?

Ans :

DELHI 2017

The female athlete triad is a syndrome observed in physically active women that involves a combination of three interrelated conditions:

1. Eating Disorders:
 - i. Description: These include restrictive eating habits, anorexia, bulimia, or other behaviors that lead to inadequate caloric intake and nutrient deficiencies.
 - ii. Impact: Inadequate nutrition compromises energy levels, reducing stamina and overall performance.
2. Amenorrhea:

- i. Description: This is the absence or irregularity of menstrual periods, often due to low body fat or hormonal imbalances associated with intense training and inadequate nutrition.
 - ii. Impact: Amenorrhea can lead to decreased estrogen levels, affecting bone health and overall hormonal balance.
3. Osteoporosis:
- i. Description: A condition where bone density is significantly reduced, increasing the risk of fractures and long-term skeletal issues.
 - ii. Impact: Reduced bone strength can impair athletic performance and increase the risk of injuries during high-impact activities.

130. Compare the WHO exercise guidelines for children/adolescents and adults. Highlight two key differences in recommendations and the reasons behind them.

Ans : OD 2009

The WHO exercise guidelines for children/adolescents and adults differ primarily in the duration, intensity, and focus of activities:

1. Duration and Intensity:
 - i. Children/Adolescents: Recommended at least 60 minutes of moderate-to-vigorous physical activity daily. This high activity level is essential for developing motor skills, supporting rapid growth, and preventing childhood obesity.
 - ii. Adults: Recommended at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity per week, reflecting the need to balance activity with work and lifestyle responsibilities while still maintaining health and fitness.
2. Type of Activities:
 - i. Children/Adolescents: Emphasis on varied activities that include play, sports, and activities that promote overall physical development (muscle and bone strengthening at least 3 days a week).
 - ii. Adults: Focus on structured exercise routines that incorporate aerobic activities, muscle-strengthening exercises, and flexibility work to manage chronic health conditions and maintain long-term functional capacity.

131. Identify and describe three common postural deformities seen in children. For each, provide a recommended corrective measure or intervention.

Ans : FOREIGN 2006

Three common postural deformities in children include:

1. Scoliosis:
 - i. Description: A lateral curvature of the spine that can cause uneven shoulders and hips.
 - ii. Corrective Measure: Early screening, physical therapy exercises to strengthen back muscles, and in moderate cases, the use of a brace to prevent further curvature.
2. Lordosis:
 - i. Description: An exaggerated inward curve of the lower back that may result in a swayback appearance.
 - ii. Corrective Measure: Core strengthening exercises, stretching of the hip flexors, and physical therapy to improve posture and spinal alignment.
3. Bow Legs (Genu Varum):
 - i. Description: A condition where the legs curve outward at the knees, leading to a gap between the knees when standing straight.
 - ii. Corrective Measure: Targeted exercises to strengthen leg muscles, use of corrective footwear or orthotics, and in severe cases, consultation with an orthopedic specialist.

132. Using examples, explain how early intervention in postural deformities in children can improve long-term athletic performance and overall health outcomes.

Ans : SQP 2001

Early intervention in postural deformities is essential for preventing long-term complications and ensuring optimal physical development, which in turn enhances athletic performance:

1. Example 1 : Correcting Knock Knees
 - i. Intervention: Early screening and targeted exercises such as quadriceps and hip-strengthening routines can help realign the knees.
 - ii. Outcome: Improved gait and balance, reducing the risk of injuries and enabling smoother participation in sports like running or soccer.

2. Example 2 : Addressing Round Shoulders
 - i. Intervention: Postural training combined with stretching and strengthening exercises for the back muscles encourages proper alignment.
 - ii. Outcome: Enhanced upper body strength and endurance, which benefits sports requiring good posture, such as swimming and basketball.
3. Example 3 : Managing Flat Foot
 - i. Intervention: Use of orthotics and specific foot-strengthening exercises can support the arch.
 - ii. Outcome: Better stability and reduced risk of overuse injuries, paving the way for improved performance in dynamic sports.
- iii. General Advice: Ensure that children under five are not sedentary for long periods during their waking hours.
3. Early Childhood (4-7 years):
 - i. Focus: Shift towards developing competence in various movement skills such as throwing, jumping, kicking, and running.
 - ii. Group Activities: Increase emphasis on group activities and develop fine motor skills alongside overall movement coordination.
 - iii. Activity Duration: Children should engage in physical activities for at least 60 minutes each day.
4. Late Childhood (8 to 12 years):
 - i. Physical Development: As children grow stronger, their movements become more controlled and precise.
 - ii. Sports Participation: Encourage participation in competitive sports and team games, and introduce the basics of sports training.
 - iii. Talent Identification: This is an ideal time for instructors and parents to identify and nurture any budding sporting or athletic talent.

FIVE MARKS QUESTIONS

- 133.** Describe exercise guidelines at different stages of growth in children. Give suitable examples for every stage.

Ans :

COMP 2018

1. Infancy (1 to 3 years):
 - i. Purpose: Develop head control, ensure the baby can sit and crawl, and promote gross motor skills.
 - ii. Activities: Encourage arm movements, reaching for objects, throwing, stopping, and picking up balls.
 - iii. General Advice: Babies should be active during all waking hours, engaging in activities like reaching, grasping, pulling, pushing, and moving their head and limbs. Once they begin to crawl, activities like chasing a rolling ball in a safe, supervised environment should be encouraged.
2. Toddlers (Walking Children):
 - i. Activity Duration: Aim for over 180 minutes of physical activity spread throughout the day.
 - ii. Types of Activity: Include both light activities (standing, moving around, rolling, playing) and more vigorous actions (skipping, hopping, running, jumping, climbing, bike riding, water play, chasing games, and ball games).
5. Adolescence (13 to 19 years):
 - i. Exercise Intensity: Recommend moderate to high-intensity exercises as the child grows older.
 - ii. Exercise Focus: Emphasize stamina building, muscle strengthening, and bone strengthening exercises.
 - iii. Daily Activity: Adolescents should aim for at least 60 minutes of moderate to intense exercise each day and learn about proper nutrition before and after workouts.
6. Adulthood:
 - i. Regular Physical Activity: Adults should allocate time for regular exercise to maintain or improve health.
 - ii. Exercise Types: Incorporate both aerobic and strength training exercises weekly.
 - iii. Recommendations: Engage in at least 150 minutes of moderate aerobic activities (such as cycling or brisk walking) per week and perform strength exercises on two or more days per week that target all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).

134. Exercises have numerous physiological and physical benefits on children. Explain in detail.

Ans :

Delhi 2017

1. Enhances Posture and Body Shape : Weight training not only builds muscular strength but also shapes the body by developing balanced muscles, which in turn enhances athletic ability and overall posture.
2. Boosts Muscle Strength, Bone Density, and Endurance : Aging naturally reduces muscle and bone mass—an issue especially critical for women. Regular weight training helps counteract these losses by increasing muscle strength and improving bone density for both genders.
3. Improves Motor Performance : Strengthening exercises enhance muscle tone and strength, ensuring that muscles work in the proper sequence. This leads to smoother, more coordinated motor functions.
4. Maintains a Healthy Weight : Studies have shown that building type II muscle fibers through weight training enhances whole-body metabolism. An increase in these fibers can reduce body fat without altering diet, aiding in obesity prevention.
5. Lowers Diabetes Risk : Research indicates that men who engage in weight training for 150 minutes per week—about five 30-minute sessions—experience a 34% reduction in the risk of developing type 2 diabetes.
6. Reduces Depression and Enhances Mood : Both aerobic exercises and weight training improve physical health and boost mood. With faster visible results from weight training, the associated positive psychological effects tend to manifest sooner.
7. Encourages Consistent Exercise Habits : Quick, observable results from weight training, when paired with a proper diet, motivate individuals to continue exercising and can inspire others to adopt a more active lifestyle.
8. Improves Sports Performance : Weight training translates to better stamina, dexterity, endurance, and hand-eye coordination across various sports such as cricket, basketball, or hockey. Athletes benefit from the enhanced strength and endurance necessary for sustained performance in competitive events.

135. What is Osteoporosis? Explain factors those lead to Osteoporosis in women.

or

Write in brief about osteoporosis. What are the causes of osteoporosis in women?

Ans :

DELHI, AI 2017

Low Bone Mass (Osteoporosis) : Osteoporosis occurs when bones lack sufficient calcium mineral, resulting in reduced bone mass and weakened bones. Normally, physical activity supports the development of a healthy skeleton and strong bones. However, excessive exercise may be problematic if regular menstrual cycles and normal estrogen levels are not maintained. This is particularly important for teenage girls, who require a proper balance of exercise, body weight, calcium, vitamin D, and estrogen for optimal bone health.

Osteoporosis can be triggered by several factors:

1. Inadequate Calcium or Vitamin D Intake : A diet deficient in calcium and/or vitamin D impairs bone mineralization.
2. Amenorrhea : Girls who experience amenorrhea (absence of menstruation for over six months) are prone to osteoporosis due to low estrogen levels, a hormone crucial for calcium absorption in women.
3. Eating Disorders : Conditions like anorexia or bulimia not only lead to nutritional deficiencies but also contribute to osteoporosis, as they reduce the intake of essential fats needed for estrogen production.
4. Other Factors : Certain foods that are typically considered healthy may contain calcium that the body cannot absorb effectively. For example, spinach, soybeans, and cocoa contain oxalic acid, which binds to calcium and significantly hinders its absorption.

136. What are the causes of 'Flat-Foot' and 'Knock-Knees'? Suggest physical activities as corrective measures for these deformities.

Ans :

Delhi 2017

1. Causes of Flat Feet
 - i. Developmental Factors : Flat feet are linked to the tissues and bones in the feet and lower legs. This condition is normal in babies and toddlers, as it takes time for the tendons to firm up and create a proper arch.
 - ii. Bone Fusion Issues : In some cases, the bones in a child's feet may fuse, which

- can cause discomfort.
- iii. Tendon Laxity or Damage : Incomplete tightening of the tendons can result in flat feet. With aging or injury, the tendons in one or both feet may become damaged, leading to the condition.
 - iv. Associated Medical Conditions : Diseases such as cerebral palsy and muscular dystrophy are also linked to flat feet.
 - v. Genetic Factors : Flat feet often run in families, indicating a hereditary component.
 - vi. Injuries in Active Individuals : Highly athletic or physically active people may develop flat feet due to injuries to the foot and ankle.
 - vii. Aging : Older individuals, who are more susceptible to falls or other physical injuries, are at increased risk.
2. Corrective Measures for Flat Feet
 - i. Orthopedic Inserts : Consult with a doctor to use arch-supporting shoe inserts.
 - ii. Alternate Footwear : Regularly changing your footwear can prevent the feet from adapting to a specific shoe shape, especially during physical activity.
 - iii. Weight Management : Losing excess weight reduces the pressure on your feet. A study published in the 2006 issue of "Obesity" noted that overweight children tended to have significantly lower arches compared to those at a healthier weight.
 3. Causes of Knock-Knee
 - i. Genetic Predisposition : Knock-knee often appears as a hereditary trait.
 - ii. Nutritional Deficiencies : Poor nutrition can contribute to the development of knock-knee.
 - iii. Obesity : Excess body weight is a major factor in causing knock-knee.
 - iv. Injuries : Damage to the shinbone in one leg may lead to knock-knee.
 - v. Rickets : A deficiency in calcium and vitamin D, as seen in rickets, can also cause knock-knee.
 - vi. Osteomyelitis : Bone infections may contribute to the condition.
 4. Corrective Measures for Knock-Knee
 - i. Orthotic Interventions : While remedies like horse riding and placing pillows between the knees are sometimes practiced, medical professionals typically recommend walking calipers, which can

be calibrated to suit individual needs and track improvements.

- ii. Yoga Postures : Physiotherapists suggest poses such as Padmasana and Gomukhasana. These should always be performed under medical guidance.

137. Give your outlook on participation of Indian women in sports.

Ans :

OD 2020

Although sports are universal and ideally non-discriminatory regarding color, caste, creed, gender, or race, women's participation remains significantly lower in many parts of the world, including India.

Impact of Women's Participation in Sports: Involvement in sports empowers women by developing individual and team skills, improving health, and benefiting both families and society. Sporting activities foster mental well-being, independence, enhanced concentration, discipline, and even lead to greater fame, as well as improved access to education and employment opportunities.

Despite strong performances by women's teams, there is generally low spectator interest in women's sports, resulting in limited television coverage and sponsorship. However, emerging role models such as Karnam Malleshwari, Mary Kom, Saina Nehwal, Sakshi Malik, P.V. Sindhu, P.T. Usha, Jwala Gutta, Geeta Phogat, and Sania Mirza are beginning to change this trend. The recent successes of women's cricket and hockey teams have further boosted the popularity of women's sports among both sponsors and audiences. Increased spectator interest typically leads to better sponsorship deals, higher prize money, more career opportunities, and a greater number of tournaments.

138. Women participation in sports is not encouraging. Identify and explain various sociological factors which might have effected women participation in sports.

Ans :

Delhi 2016 C

The sociological aspect of women's participation in sports significantly influences their involvement.

1. Socio-cultural and Economic Barriers: There is a prevailing notion that sports are a masculine pursuit, a perception deeply rooted in traditions, beliefs, and social practices. This view implies that women should not be competitive or possess a muscular physique.

Additionally, there is an unfounded link between participation in sports and socially unacceptable behaviors. Key factors include:

- i. **Family :** Family plays a critical role in the sports socialization of girls. Worldwide, and particularly in India, boys are generally encouraged to engage in sports, provided with better facilities, and offered role models to emulate. In contrast, girls receive less encouragement. Even in progressive and educated societies, women are more often steered toward sports like gymnastics, athletics, and dancing, while rarely being encouraged to try wrestling, boxing, or weightlifting. Parents are therefore pivotal in motivating female children to participate in sports.
 - ii. **Educational Institutions :** The sporting facilities in schools and the support provided by teachers and coaches greatly impact sports participation. In many coeducational schools, girls are seldom encouraged to take part in sports such as football, hockey, and athletics, and girls' schools often lack proper facilities for these activities.
 - iii. **Social Culture :** The belief that "a woman's place is in the kitchen" is still prevalent in many societies. This stereotype suggests that women will spend most of their lives in domestic roles, making sports seem like an unnecessary use of time and resources.
 - iv. **Social Prejudice :** Women who actively participate in sports and aim for high achievements are frequently labeled as too masculine, discouraging many girls from engaging in sports like wrestling and weightlifting.
 - v. **Religious Beliefs and Practices :** In many cultures, strict religious practices, including rituals and fasting, are imposed on women from a young age, posing additional barriers to sports participation.
2. **Practical Barriers :** Economic challenges, such as poverty and limited financial resources, also hinder participation. Many girls from impoverished backgrounds or schools with inadequate sports facilities cannot take part in sports. Additionally, those facing financial hardships often have to work to support themselves, reducing the time available for sports. In cases where participation is possible, a lack of safe and appropriate infrastructure,

along with inadequate sportswear, further impedes performance.

- 139.** Write briefly about menstrual dysfunctions and their effect on sports participation of female athletes.

Ans :

SQP 2018

Menstrual dysfunction refers to irregularities and uncertainties in a woman's menstrual cycle.

1. **Effects on Sports Participation:**
 - i. Athletic training and exercise generally do not affect the onset of menarche or regular menstrual periods.
 - ii. However, very heavy and intense training programs may lead to amenorrhea (the absence of menstruation).
 - iii. Exercise can be beneficial by reducing menstrual pain (dysmenorrhea).
 - iv. At times, strength may decline during certain phases of the menstrual cycle, impacting performance.
 - v. Lower hemoglobin levels can reduce oxygen intake, further affecting sports performance.
 - vi. Unpredictable menstrual cycles can also cause stress and anxiety.
2. **Menstruation and Sports Performance :** There is significant hormonal variation between the follicular and luteal phases of the menstrual cycle, making it challenging to establish a stable physiological condition, which can have practical implications for training and competition. Despite varied individual experiences, female athletes generally take appropriate precautions. Menstruation is not typically viewed as a barrier to training or competition; with proper guidance and care, it is integrated into daily life. Coaches and support staff working with female athletes should consider:
 - i. The menstrual cycle itself,
 - ii. Physiological and metabolic variations during the cycle,
 - iii. Adapting training regimens to align with different menstrual phases, and
 - iv. Addressing menstrual disorders and aspects of the Female Athlete Triad.

- 140.** Participation in physical activities can be utilised as corrective measures for correcting postural deformities among children. Justify.

Ans :

Delhi 2016 C

Faulty posture, or postural deviation, can occur in the muscles, bones, or both, manifesting as either an exaggeration or a reduction of the body's natural curves. This deviation often leads to discomfort and pain because:

1. It creates uneven pressure on joint surfaces.
2. It places additional strain on ligaments.
3. It forces muscles to work harder to maintain an upright position.

Maintaining proper posture and engaging in targeted physical activities play a crucial role in preventing and, in many cases, correcting these deformities. Key benefits of regular physical activity include:

1. **Muscle Health:** Proper alignment allows muscles to operate as intended, promoting overall muscle health, preventing aches, and reducing fatigue.
2. **Enhanced Breathing:** A good posture helps keep the body aligned, which prevents airway constriction and ensures an optimal flow of oxygen. This is essential for delivering oxygen to organs, the nervous system, tissues, and muscles.
3. **Improved Circulation:** Poor posture can fatigue muscles and compress the blood vessels that supply them, hindering proper blood flow.
4. **Prevention of Bone Wear and Arthritis:** Correct alignment ensures that muscles and ligaments support joints appropriately, preventing abnormal movements and reducing the risk of arthritis. This proper use of muscles also helps avoid excessive wear on joint surfaces.

- 141.** Describe common postural deformities such as knock knees, flat foot, round shoulders, lordosis, kyphosis, scoliosis, and bow legs. Choose one deformity and detail its corrective measures.

Ans :

COMP 2004

Postural deformities are abnormal alignments of the body that can develop due to poor posture, muscle imbalances, or genetic predispositions. Some common deformities include:

1. **Knock Knees:** Where the knees angle inward.
2. **Flat Foot:** A condition where the arches of the feet collapse.
3. **Round Shoulders:** A forward curvature of the shoulders.
4. **Lordosis:** An excessive inward curvature of the lower back.
5. **Kyphosis:** An exaggerated forward rounding

of the upper back.

6. **Scoliosis:** A lateral, or sideways, curvature of the spine.
7. **Bow Legs:** An outward curvature of the legs, making them appear bowed.

Focusing on Scoliosis, this condition involves a lateral curvature of the spine, often accompanied by a rotation of the vertebrae. Early detection is key to management. Corrective measures include physical therapy, which focuses on core strengthening and postural alignment exercises. Specific exercises such as side planks and rotational stretches help to balance the muscles along the spine. In addition, bracing may be recommended for growing adolescents with moderate curves to prevent further progression. For severe cases, surgical intervention might be necessary to correct the curvature and stabilize the spine. Regular monitoring, along with targeted exercises, helps reduce discomfort and improve overall posture, allowing the individual to participate more comfortably in sports and daily activities.

- 142.** Discuss the physical, psychological, and social benefits of women's participation in sports, providing examples that illustrate these benefits.

Ans :

SQP 2010

Women's participation in sports yields a wide range of benefits that extend well beyond physical fitness. Physically, engaging in sports helps improve cardiovascular health, muscular strength, flexibility, and overall endurance. Activities such as running, swimming, or team sports not only contribute to weight management and enhanced stamina but also reduce the risk of chronic diseases like diabetes and heart conditions. For example, regular participation in a sport like soccer or volleyball increases strength and agility, leading to better overall health.

Psychologically, sports participation can greatly boost self-esteem, reduce stress, and alleviate symptoms of anxiety and depression. The discipline and focus required during training sessions often lead to improved mental resilience and better mood regulation. Women who actively participate in sports frequently report feeling more empowered and confident in their daily lives. For instance, a female marathon runner often develops a strong sense of achievement and self-worth through the process of setting and reaching personal goals.

Socially, sports provide a platform for

building supportive networks and community engagement. Team sports encourage collaboration, communication, and the development of strong interpersonal relationships. Women who participate in sports often benefit from enhanced social interactions, which can lead to lasting friendships and professional networking opportunities. Additionally, sports can challenge traditional gender roles, promoting gender equality and inspiring younger generations to pursue their athletic interests without bias.

- 143.** Explain the special considerations necessary for adolescent female athletes regarding menarche and menstrual dysfunction. How should coaches and trainers address these challenges?

Ans :

COMP 2012

Adolescent female athletes face unique physiological challenges related to menarche (the onset of menstruation) and potential menstrual dysfunction. Menarche can vary widely in age and may be influenced by factors such as genetics, nutrition, and physical activity levels. For many young athletes, the onset of menstruation can bring about physical discomfort, hormonal fluctuations, and changes in energy levels, which may affect performance and training routines.

Coaches and trainers must adopt a sensitive and informed approach when addressing these challenges. First, it is important to educate both the athletes and their parents about the normal variations in menstrual cycles and the potential impact on performance. Creating an open and supportive environment allows athletes to discuss menstrual-related issues without stigma. Training programs should be designed with flexibility in mind—incorporating rest days and adjustments in intensity during periods when an athlete may experience discomfort or reduced energy.

Nutrition also plays a key role in managing menstrual health. Emphasizing a balanced diet rich in iron, calcium, and essential vitamins can help mitigate some of the adverse effects of menstrual dysfunction. Regular medical check-ups and consultations with a healthcare professional specializing in sports medicine or gynecology are recommended to monitor health and address any emerging issues early. By integrating these considerations into training and support systems, coaches can help adolescent female athletes maintain peak performance while ensuring their overall well-being during this critical phase of development.

- 144.** Define the female athlete triad, including osteoporosis, amenorrhea, and eating disorders, and discuss strategies for its prevention and management.

Ans :

DELHI 2005

The female athlete triad is a syndrome observed in physically active women, characterized by the interrelated conditions of low energy availability (often due to disordered eating), menstrual dysfunction (amenorrhea), and decreased bone mineral density (osteoporosis). This triad presents significant health risks, particularly for athletes involved in sports emphasizing leanness or weight control.

Osteoporosis refers to weakened bones that are more susceptible to fractures. Amenorrhea, the absence or irregularity of menstruation, results from hormonal imbalances linked to insufficient energy intake. Eating disorders can include behaviors ranging from restrictive eating to severe caloric deficits, further exacerbating the energy imbalance.

Prevention and management strategies for the female athlete triad begin with education and early detection. Coaches, trainers, and healthcare professionals should be trained to recognize early signs such as unexplained weight loss, irregular menstrual cycles, or increased incidence of stress fractures. Nutritional counseling is essential; ensuring athletes receive adequate calories, nutrients, and hydration is fundamental to maintaining energy balance. A multidisciplinary approach is crucial—integrating sports medicine, nutrition, and mental health support—to address the physical and psychological aspects of the condition.

Adjustments in training regimens may also be necessary to reduce excessive stress on the body while recovery is underway. Establishing a supportive environment that de-stigmatizes the discussion of menstrual health and eating behaviors is critical. Regular follow-ups and individualized plans help in not only managing but also preventing the triad, thereby safeguarding the long-term health and athletic performance of female athletes.

- 145.** Explain the WHO exercise guidelines for various age groups and analyze their significance in promoting healthy physical activity habits among children.

Ans :

OD 2011

The World Health Organization (WHO) exercise guidelines provide a structured framework for physical activity that caters to different age groups, ensuring that each developmental stage receives an appropriate level of exercise. For children aged 5–17 years, the guidelines recommend a minimum of 60 minutes of moderate-to-vigorous physical activity daily. This activity should include exercises that improve cardiovascular endurance, muscular strength, and flexibility, as well as bone-strengthening activities at least three times per week. For younger children, the emphasis is on active play and movement, promoting the development of motor skills and coordination.

The significance of these guidelines lies in their ability to instill healthy exercise habits early in life. Regular physical activity is essential for the physical development of children, helping to build strong bones and muscles, improve balance and coordination, and reduce the risk of childhood obesity. In addition to physical benefits, exercise also enhances cognitive function, contributes to improved concentration in academic settings, and fosters social interactions through group play and sports participation.

Moreover, establishing a routine of daily physical activity sets a precedent for lifelong fitness and well-being. It helps children develop discipline and time management skills while also promoting mental health by reducing symptoms of anxiety and depression. These guidelines provide a comprehensive approach to fostering a balanced lifestyle that integrates physical, cognitive, and social development, ensuring that children not only grow stronger but also learn the value of maintaining an active lifestyle.

- 146.** Identify and explain the corrective measures for common postural deformities in children such as knock knees, flat foot, and round shoulders. Illustrate one case in detail.

Ans :

FOREIGN 2013

Postural deformities in children, such as knock knees, flat foot, and round shoulders, can affect overall body alignment and lead to discomfort or long-term musculoskeletal issues if not addressed early. Corrective measures for these conditions typically involve a combination of physical therapy, targeted exercises, and in some cases, supportive devices or orthotics.

Taking knock knees as an example, this condition—where the knees angle inward—can be managed through specific exercises aimed at

strengthening the hip abductors, quadriceps, and leg muscles. Corrective measures include:

1. **Physical Therapy:** Tailored exercise programs that focus on muscle strengthening and flexibility.
2. **Orthotic Supports:** Shoe inserts or braces that help correct alignment.
3. **Postural Training:** Encouraging proper walking and standing postures to redistribute weight evenly.

For instance, a child with knock knees might be guided through exercises such as lateral leg raises, squats with proper form, and stretches that target tight inner thigh muscles. In addition, wearing supportive footwear or custom orthotics can help maintain proper leg alignment during daily activities. Regular monitoring by healthcare professionals ensures that improvements are made and that any need for additional interventions is addressed promptly.

Similarly, flat foot is often corrected using arch supports and strengthening exercises for the foot muscles, while round shoulders benefit from exercises that strengthen the back muscles and promote proper shoulder alignment. Early intervention in these conditions is critical to prevent progression and promote a healthy, balanced posture that supports overall physical activity and sports participation.

- 147.** Examine the multifaceted benefits—physical, psychological, and social—of women's participation in sports. How do these benefits contribute to overall well-being and empowerment?

Ans :

SQP 2015

Women's participation in sports has far-reaching benefits that positively affect multiple aspects of health and well-being. Physically, engaging in sports enhances cardiovascular fitness, builds muscle strength, and improves flexibility. Regular physical activity also helps in weight management and reduces the risk of chronic conditions such as heart disease, diabetes, and osteoporosis. For instance, sports like running, swimming, and cycling improve endurance and overall physical fitness.

Psychologically, involvement in sports fosters self-confidence, reduces stress levels, and helps manage symptoms of anxiety and depression. The structure of sports training, goal-setting, and achievement instills discipline and mental resilience. When women participate in sports, they often experience a boost in self-esteem and

a sense of accomplishment, which translates into greater self-worth and motivation in other areas of life.

Socially, sports create opportunities for women to build strong networks and friendships. The teamwork and camaraderie that develop within a sports environment promote a sense of belonging and mutual support. This social interaction not only enhances communication skills but also challenges traditional gender norms, empowering women to take leadership roles and advocate for equality. The visibility of female athletes serves as an inspiration to younger generations, encouraging them to pursue sports without hesitation.

Together, these benefits contribute to overall well-being by promoting a balanced lifestyle that integrates physical fitness, mental health, and social connectedness. Sports act as a catalyst for empowerment by enabling women to overcome barriers, assert their presence, and drive positive change both on and off the field.

- 148.** Discuss the special considerations necessary for adolescent female athletes regarding menarche and menstrual dysfunction. What strategies can be adopted to ensure their well-being and optimal performance?

Ans :

COMP 2019

Adolescent female athletes face unique challenges as they navigate the physical and hormonal changes associated with menarche—the onset of menstruation—and potential menstrual dysfunction. These physiological changes can affect performance, energy levels, and overall health. Menarche can be accompanied by symptoms such as cramps, mood swings, and fatigue, which may hinder athletic performance if not properly managed. Additionally, menstrual dysfunction, including irregular cycles or amenorrhea, can signal an imbalance in energy availability, often linked to excessive training or inadequate nutrition.

Special considerations for these athletes include creating a supportive environment that encourages open dialogue about menstrual health. Coaches, trainers, and parents should be educated on the normal variations of the menstrual cycle and the impact of rigorous training on menstrual patterns. Adopting flexible training schedules that account for periods of discomfort and reduced energy can help mitigate performance dips. Furthermore, ensuring that young athletes receive

balanced nutrition is essential; diets rich in iron, calcium, and vitamins help manage symptoms and support overall health.

Regular health check-ups and consultations with sports medicine professionals or gynecologists are recommended to monitor menstrual health and address any concerns early. Incorporating rest days and modifying training intensity during challenging phases of the cycle can help maintain a healthy balance between training and recovery. By implementing these strategies, the well-being of adolescent female athletes can be safeguarded, allowing them to achieve optimal performance while managing the natural challenges of menarche and menstrual dysfunction.

- 149.** Define the female athlete triad, including its components of osteoporosis, amenorrhea, and eating disorders, and outline preventive and management strategies for this condition.

Ans :

DELHI 2014

The female athlete triad is a clinical syndrome that encompasses three interrelated components: low energy availability (often due to disordered eating), menstrual dysfunction (amenorrhea), and decreased bone mineral density (osteoporosis). Each of these components poses serious health risks for female athletes, affecting performance and long-term well-being.

Osteoporosis in this context refers to a reduction in bone strength, making bones more prone to fractures. Amenorrhea—the absence or irregularity of menstrual periods—often results from an energy imbalance where the body's nutritional needs are not met, leading to hormonal disruptions. Eating disorders range from restrictive dieting to severe caloric deficits, which further compound the energy deficiency.

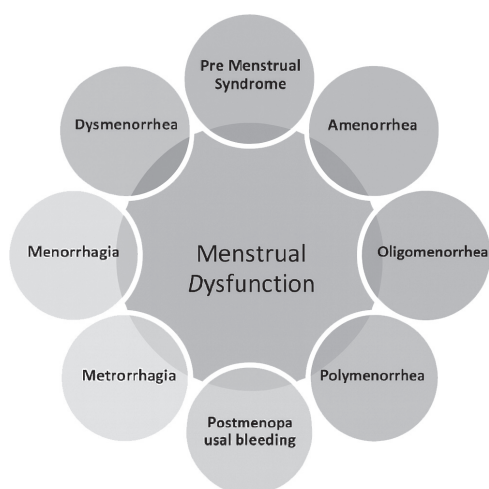
Preventive strategies begin with education, emphasizing the importance of balanced nutrition and regular menstrual cycles as indicators of overall health. Coaches and healthcare professionals should be vigilant in monitoring athletes for early signs of the triad. Nutritional counseling is key, with individualized meal plans that ensure sufficient caloric intake and a balanced diet rich in essential nutrients like calcium and vitamin D to support bone health.

Management of the triad typically involves a multidisciplinary approach. Adjustments in training intensity, coupled with psychological support to address any underlying eating disorders, are critical. Regular medical evaluations and bone

density assessments help track progress and ensure that any interventions are effective. By adopting a proactive approach that integrates education, nutrition, and tailored training modifications, the risks associated with the female athlete triad can be significantly reduced, ensuring the long-term health and performance of female athletes.

CASE BASED QUESTION

150. In reference to the picture answer the following questions :



- (i) Which of the following refers to the absence of menstrual periods for three or more months in a row?
- Dysmenorrhea
 - Amenorrhea
 - Oligomenorrhea
 - Polymenorrhea

Ans :

- (b) Amenorrhea
- (ii) Which condition describes painful menstrual cramps, often with lower abdominal pain?
- Metrorrhagia
 - Dysmenorrhea
 - Menorrhagia
 - Amenorrhea

Ans :

- (b) Dysmenorrhea
- (iii) Which of the following is characterized by abnormally heavy or prolonged menstrual

bleeding?

- Menorrhagia
- Polymenorrhea
- Oligomenorrhea
- Metrorrhagia

Ans :

- (a) Menorrhagia
- (iv) Which term describes bleeding at irregular intervals, especially between expected menstrual periods?
- Amenorrhea
 - Dysmenorrhea
 - Menorrhagia
 - Metrorrhagia

Ans :

- (d) Metrorrhagia

151. In reference to the picture answer the following questions :



- (i) The postural defect shown in the image is:
- Bow Legs
 - Flat Foot
 - Knock Knees
 - Round Shoulders

Ans :

- (b) Flat Foot
- (ii) Which structure is primarily affected by this condition?
- Shoulder girdle
 - Hip joint
 - Arch of the foot
 - Neck region

Ans :

- (c) Arch of the foot
- (iii) Which factor can contribute to flat foot?
- Excessive curvature in the lower spine
 - Weak or overstretched tendons supporting the arch
 - Tight hamstring muscles
 - Weak upper back muscles

Ans :

- (b) Weak or overstretched tendons supporting the arch
- (iv) Which measure can help correct or manage flat foot?
 - (a) Neck stretches
 - (b) Shoulder shrugs
 - (c) Forearm rotations
 - (d) Foot-strengthening exercises or orthotics

Ans :

- (d) Foot-strengthening exercises or orthotics

152. In reference to the picture answer the following questions :



NODIA

- (i) The postural defect shown in the image is:
 - (a) Lordosis
 - (b) Round Shoulders
 - (c) Scoliosis
 - (d) Flat Back

Ans :

- (b) Round Shoulders
- (ii) Which part of the body is most visibly affected by round shoulders?
 - (a) Lumbar region
 - (b) Pelvic region
 - (c) Upper back and shoulder girdle
 - (d) Lower leg muscles

Ans :

- (c) Upper back and shoulder girdle
- (iii) Which of the following can contribute to round shoulders?
 - (a) Tight chest muscles and weak upper back muscles
 - (b) Excessive lower back curvature
 - (c) Weak ankle joints
 - (d) Overdeveloped abdominal muscles

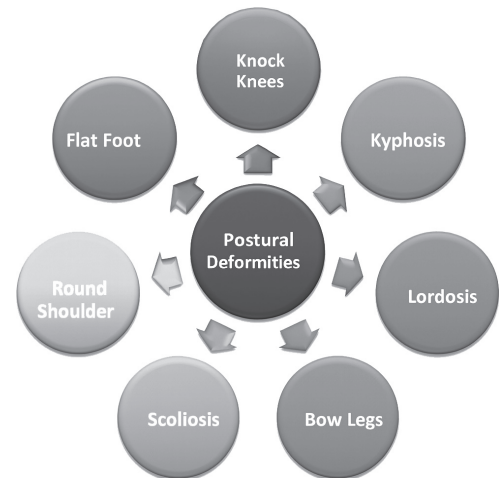
Ans :

- (a) Tight chest muscles and weak upper back muscles
- (iv) Which exercise or corrective measure can help improve round shoulders?
 - (a) Shoulder retraction exercises (e.g., rowing)
 - (b) Calf raises
 - (c) Deep squats
 - (d) Wrist rotations

Ans :

- (a) Shoulder retraction exercises (e.g., rowing)

153. In reference to the picture answer the following questions :



- (i) Which postural deformity is characterized by a lateral curvature of the spine?
 - (a) Kyphosis
 - (b) Lordosis
 - (c) Scoliosis
 - (d) Bow Legs

Ans :

- (c) Scoliosis
- (ii) Which condition describes an excessive inward curvature of the lower (lumbar) spine?
 - (a) Flat Foot
 - (b) Knock Knees
 - (c) Lordosis
 - (d) Round Shoulders

Ans :

- (c) Lordosis
- (iii) Which postural defect is characterized by the knees curving inward, often touching or “knocking” together?

- (a) Bow Legs
- (b) Knock Knees
- (c) Kyphosis
- (d) Flat Foot

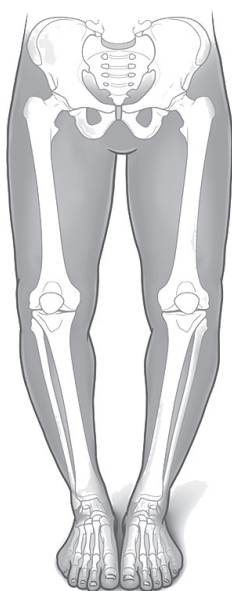
Ans :

- (b) Knock Knees
- (iv) Which postural deformity involves an excessive outward curvature of the thoracic spine, often leading to a hunched upper back?
 - (a) Kyphosis
 - (b) Round Shoulders
 - (c) Scoliosis
 - (d) Lordosis

Ans :

- (a) Kyphosis

154. In reference to the picture answer the following questions :



- (i) The postural defect shown in the image is:
 - (a) Bow Legs
 - (b) Knock Knees
 - (c) Flat Foot
 - (d) Round Shoulders

Ans :

- (b) Knock Knees
- (ii) Which term describes the medical name for Knock Knees?
 - (a) Genu varum
 - (b) Genu valgum
 - (c) Genu recurvatum
 - (d) Genu extrorsum

Ans :

- (b) Genu valgum
- (iii) Which of the following is a common characteristic of Knock Knees?
 - (a) Ankles touch while knees remain apart
 - (b) Knees touch while ankles remain apart
 - (c) Excessive curvature in the thoracic spine
 - (d) Lateral curvature of the spine

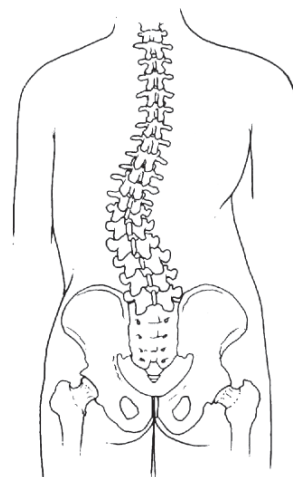
Ans :

- (b) Knees touch while ankles remain apart
- (iv) Which corrective measure can help improve Knock Knees?
 - (a) Strengthening exercises for lateral hip muscles
 - (b) Neck stretches
 - (c) Shoulder shrugs
 - (d) Wrist rotations

Ans :

- (a) Strengthening exercises for lateral hip muscles

155. In reference to the picture answer the following questions :



- (i) The postural defect shown in the image is:
 - (a) Kyphosis
 - (b) Lordosis
 - (c) Scoliosis
 - (d) Bow Legs

Ans :

- (c) Scoliosis

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- (ii) Which of the following best describes Scoliosis?
- (a) Excessive outward curvature of the thoracic spine
 - (b) Excessive inward curvature of the lumbar spine
 - (c) Lateral (sideways) curvature of the spine
 - (d) Forward rounding of the shoulders

Ans :

- (c) Lateral (sideways) curvature of the spine
- (iii) Which symptom is often associated with Scoliosis?
- (a) Uneven shoulders or hips
 - (b) Knees touching while ankles remain apart
 - (c) Excessive foot pronation
 - (d) Head protruding forward

Ans :

- (a) Uneven shoulders or hips
- (iv) Which of the following can be a helpful intervention for mild Scoliosis?
- (a) Neck rotations
 - (b) Wearing a back brace (as prescribed)
 - (c) Ankle strengthening exercises
 - (d) Shoulder shrugs

Ans :

- (b) Wearing a back brace (as prescribed)

156. In reference to the picture answer the following questions :



- (i) The postural defect shown in the image is:
- (a) Kyphosis
 - (b) Scoliosis
 - (c) Lordosis
 - (d) Flat Back

Ans :

- (c) Lordosis
- (ii) Which region of the spine is primarily affected by Lordosis?
- (a) Cervical
 - (b) Thoracic
 - (c) Lumbar
 - (d) Sacral

Ans :

- (c) Lumbar
- (iii) Which description best fits Lordosis?
- (a) Lateral curvature of the spine
 - (b) Excessive outward curvature of the thoracic spine
 - (c) Excessive inward curvature of the lumbar spine
 - (d) Forward rounding of the shoulders

Ans :

- (c) Excessive inward curvature of the lumbar spine
- (iv) Which corrective measure can help manage Lordosis?
- (a) Strengthening the abdominal and hamstring muscles
 - (b) Wearing ankle braces
 - (c) Performing only calf raises
 - (d) Doing neck rotations

Ans :

- (a) Strengthening the abdominal and hamstring muscles

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CHAPTER 3

YOGA AS PREVENTIVE MEASURE FOR LIFESTYLE DISEASE

SUMMARY

1. OBESITY

Yoga for obesity targets weight reduction, improved metabolic function, and overall body toning. The practices are designed not only to burn calories but also to stimulate the digestive and endocrine systems, leading to a more balanced metabolism.

1.1 Procedures

1. Tadasana (Mountain Pose): Establishes a strong, grounded base by promoting proper posture and activating the core muscles. It is often the starting posture that helps improve body awareness and alignment.
2. Katichakrasana (Waist-Turning Pose): Involves controlled twisting of the torso, which massages the abdominal organs, increases blood flow, and improves digestive efficiency.
3. Pawanmuktasana (Wind-Relieving Pose): Focuses on the release of trapped gas, aiding in detoxification and relieving discomfort by stimulating the abdominal area.
4. Matsyasana (Fish Pose): Opens the chest and throat, promoting deeper breathing and enhanced oxygen supply, while also stretching the abdominal muscles.
5. Halasana (Plow Pose): Involves gentle inversion to stimulate the thyroid gland, enhance digestion, and increase blood circulation in the abdominal region.
6. Pachimottasana (Seated Forward Bend): Provides a deep stretch for the spine and hamstrings, aiding in the stimulation of abdominal organs and reducing stress.
7. Ardha-Matsyendrasana (Half-Spinal Twist): Encourages spinal mobility and massages the digestive system, which is vital for metabolic regulation.

NODIA

8. Dhanurasana (Bow Pose): Engages and tones the entire body, particularly the core and back muscles, enhancing strength and flexibility.
9. Ushtrasana (Camel Pose): Opens up the chest and stretches the abdomen, promoting better respiratory function and stimulating the digestive system.
10. Suryabhedan Pranayama (Sun-Piercing Breath): A dynamic breathing technique aimed at activating the sympathetic nervous system to boost metabolism and energy levels.

1.2 Benefits

These combined practices help reduce adipose tissue by stimulating metabolism, promoting fat oxidation, and improving digestive function. They foster improved muscle tone and flexibility while reducing stress and promoting mental clarity—an important factor in curbing emotional eating. The holistic approach not only contributes to weight loss but also enhances overall fitness, balance, and self-esteem.

1.3 Contraindications

Individuals with significant joint issues, severe musculoskeletal pain, or advanced cardiovascular conditions should exercise caution. Inversions (like Halasana) and deep forward bends (such as Pachimottasana) may place undue strain on joints, particularly in obese individuals with limited mobility. Modifications or professional supervision are recommended to ensure safe practice.

2. DIABETES

Yoga practices for diabetes aim to regulate blood sugar levels, enhance insulin sensitivity, and improve circulation through a series of dynamic and static postures combined with controlled breathing techniques.

2.1 Procedures

1. Katichakrasana (Waist-Turning Pose) & Ardha-Matsyendrasana (Half-Spinal Twist): These twisting poses stimulate the abdominal region, promoting improved digestion and the efficient functioning of internal organs, including the pancreas, which plays a crucial role in insulin secretion.
2. Pavanmuktasana (Wind-Relieving Pose): Enhances digestive efficiency and detoxification, indirectly supporting blood sugar regulation by ensuring optimal nutrient assimilation.
3. Bhujangasana (Cobra Pose): Opens the chest and strengthens the back muscles, thereby improving overall circulation and stimulating metabolic processes.
4. Shalabhasana (Locust Pose): Strengthens the back, glutes, and legs, which helps improve blood flow and metabolic rate.
5. Dhanurasana (Bow Pose): Acts as a full-body workout that increases core strength and stimulates digestive and endocrine functions.
6. Supta-Vajrasana (Reclined Hero Pose) & Paschimottasana (Seated Forward Bend): Both poses enhance flexibility, improve blood circulation, and help soothe the nervous system, contributing to better glycemic control.
7. Mandukasana (Frog Pose) & Gomukhasana (Cow Face Pose): Improve joint flexibility and encourage stress reduction, which is vital for maintaining balanced blood sugar levels.
8. Yogmudra: Utilized for enhancing mindfulness and body awareness, which can contribute to better dietary choices and stress management.
9. Kapalabhati (Skull-Shining Breath): A vigorous breathing technique that not only cleanses the respiratory system but also stimulates the digestive fire, boosting metabolism.

2.2 Benefits

The combination of these postures and breathing techniques promotes better glucose utilization and insulin sensitivity. They help regulate digestion, improve circulation, and reduce stress—all factors that contribute to stabilizing blood sugar levels. Additionally, these practices facilitate weight management and overall metabolic health, reducing the risk of complications associated with diabetes.

2.3 Contraindications

Individuals with severe joint problems, neuropathy, or cardiac conditions should modify or avoid certain poses. Kapalabhati, for instance, may be contraindicated for pregnant women or those with high blood pressure, and deep twisting poses should be adapted for those with spinal issues or significant abdominal discomfort.

3. ASTHMA

Yoga for asthma focuses on improving respiratory efficiency, reducing airway inflammation, and promoting calmness through specific asanas and controlled breathing exercises that open the chest and enhance lung capacity.

3.1 Procedures

1. Tadasana (Mountain Pose): Establishes proper alignment and promotes a deep, relaxed breathing pattern.
2. Urdhwahastottasana (Upward Salute): Elevates the arms to stretch the torso and open up the chest, facilitating greater lung expansion.
3. Uttan Mandukasana (Modified Frog Pose): Helps in expanding the thoracic cavity, gently stimulating the respiratory system without straining the body.
4. Bhujangasana (Cobra Pose) & Dhanurasana (Bow Pose): These backbends open up the chest and encourage a full range of motion in the spine, which directly benefits lung capacity by relieving constriction.
5. Ushtrasana (Camel Pose): Provides an effective stretch for the entire chest area, thereby enhancing breathing efficiency and promoting relaxation.
6. Vakrasana (Twisted Pose): Offers a gentle twist that massages internal organs and encourages better blood circulation, indirectly benefiting the respiratory system.
7. Kapalabhati (Skull-Shining Breath): This active breathing technique serves as a cleansing practice that stimulates the lungs and expels stale air, helping to clear airways.
8. Gomukhasana (Cow Face Pose) & Matsyasana (Fish Pose): These poses further assist in opening the chest and improving the flexibility of the rib cage.
9. Anuloma-Viloma (Alternate Nostril Breathing): Balances the autonomic nervous system, promotes deep relaxation, and

regulates breathing patterns, all of which are essential for managing asthma symptoms.

3.2 Benefits

These practices help expand lung capacity, improve oxygen uptake, reduce bronchial inflammation, and decrease the frequency and severity of asthma attacks. The breathing techniques in particular calm the mind and reduce stress, which can be a trigger for asthma exacerbations. Regular practice can lead to better overall respiratory health and increased endurance.

3.3 Contraindications

Individuals with acute or severe asthma symptoms should practice these under the guidance of a healthcare provider. Certain poses that involve deep backbends or extensive chest opening may require modification for those with a history of respiratory distress or concurrent back injuries. Caution should be exercised with Kapalbhathi if there is any indication of dizziness or hyperventilation.

4. HYPERTENSION

Yoga for hypertension emphasizes gentle, calming movements and deep relaxation techniques to help lower blood pressure, reduce stress, and improve overall cardiovascular health.

4.1 Procedures

1. Tadasana (Mountain Pose): Provides a grounding base that encourages proper posture and a calm state of mind.
2. Katichakrasana (Waist-Turning Pose): Involves gentle twisting to stimulate blood circulation without causing undue strain, which is beneficial for maintaining healthy blood pressure levels.
3. Uttanpadasana (Leg Extension Pose): Helps in increasing blood flow to the lower extremities while providing a mild cardiovascular workout.
4. Ardha-Halasana (Half Plow Pose): A gentle inversion that stimulates the thyroid and improves circulation, though it must be practiced with care to avoid sudden changes in blood pressure.
5. Sarala Matsyasana (Gentle Fish Pose): Opens the chest and promotes a sense of calm, contributing to lower stress levels.
6. Gomukhasana (Cow Face Pose) & Uttan

Mandukasana (Modified Frog Pose): Encourage flexibility and gentle stretching, supporting improved circulation.

7. Vakrasana (Twisted Pose) & Bhujangasana (Cobra Pose): Activate and rejuvenate the cardiovascular system without overly taxing the body.
8. Makarasana (Crocodile Pose) & Shavasana (Corpse Pose): Induce deep relaxation, allowing the heart rate and blood pressure to gradually decrease.
9. Nadi-Shodhana Pranayama (Alternate Nostril Breathing) & Sitlipranayama: These breathing techniques balance the nervous system, reduce stress hormones, and are particularly effective in managing hypertension by promoting calm and controlled breathing.

4.2 Benefits

The combination of these asanas and pranayama practices reduces overall stress, enhances relaxation, and improves the balance of the autonomic nervous system. This contributes to lower blood pressure and a more stable cardiovascular system. The gentle movements also improve circulation, decrease muscle tension, and promote overall mental well-being, which are essential in managing hypertension.

4.3 Contraindications

Individuals with uncontrolled hypertension or advanced heart conditions should avoid deep inversions and strenuous poses. Modifications and professional guidance are recommended to ensure that the practices do not inadvertently raise blood pressure or cause undue strain on the cardiovascular system.

5. BACK PAIN AND ARTHRITIS

For those suffering from back pain and arthritis, yoga provides a non-invasive method to reduce discomfort, enhance mobility, and strengthen the muscles that support the spine and joints.

5.1 Procedures

1. Tadasana (Mountain Pose): Serves as the foundation for building proper alignment and activating core muscles to support the spine.
2. Urdhwahastottasana (Upward Salute): Gently stretches the arms and back, fostering an increased range of motion and improved posture.

3. Ardha Chakrasana (Half-Wheel Pose): Mobilizes the spine, encouraging gentle curvature and flexibility without intense strain.
4. Ushtrasana (Camel Pose) & Bhujangasana (Cobra Pose): These backbends open the chest, stretch the spine, and strengthen the back muscles, which helps alleviate chronic pain.
5. Vakrasana (Twisted Pose) & Sarala Matsyendrasana (Gentle Spinal Twist): Provide controlled rotation to massage the spinal nerves and improve flexibility, reducing tension in the back.
6. Gomukhasana (Cow Face Pose): Focuses on opening the shoulders and upper back, which can relieve tension that contributes to overall back discomfort.
7. Bhadrasana (Gracious Pose) & Makarasana (Crocodile Pose): Encourage relaxation and gentle stretching, alleviating stiffness and promoting a sense of calm.
8. Nadi-Shodhana Pranayama (Alternate Nostril Breathing): Calms the nervous system, reducing stress-induced muscle tension and pain, thereby contributing to overall relief.

5.2 Benefits

These practices enhance spinal alignment and improve flexibility while reducing inflammation and pain associated with arthritis. They strengthen the core muscles, which support the spine, and improve joint mobility. The gentle, deliberate movements are effective in reducing chronic back pain and stiffness, and the emphasis on relaxation can also help in managing stress, which is often a contributing factor in pain conditions.

5.3 Contraindications

Individuals with severe back injuries, acute arthritis flare-ups, or recent spinal surgery should modify or avoid certain poses that involve deep twisting or intense stretching. It is crucial to work with a knowledgeable instructor who can offer modifications and ensure that the practices are tailored to each individual's condition, thereby preventing further injury.

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MULTIPLE CHOICE QUESTION

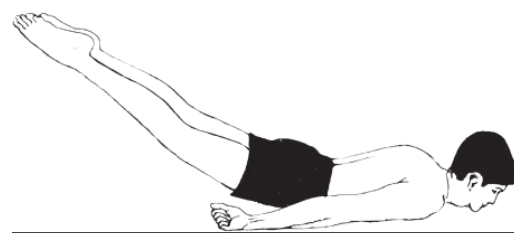
1. Which of the following pranayama is helpful to reduce obesity ?
(a) Kapalbhathi Pranayama
(b) Anulom Vilom Pranayama
(c) Suryabhedan Pranayama
(d) Sitili Pranayama

Ans :

2024

(a) Kapalbhathi Pranayama
Kapalbhathi is a dynamic breathing exercise that stimulates the abdominal muscles and improves metabolism. Its vigorous exhalations help in burning excess fat, enhancing digestion and energy levels, thereby contributing to weight loss and reduction in obesity overall effective.

2. Identify the asana shown in the picture given below and choose the correct option from the following :



- (a) Bhujangasana
(b) Katichakrasana
(c) Pawanmuktasana
(d) Shalabhasana

Ans :

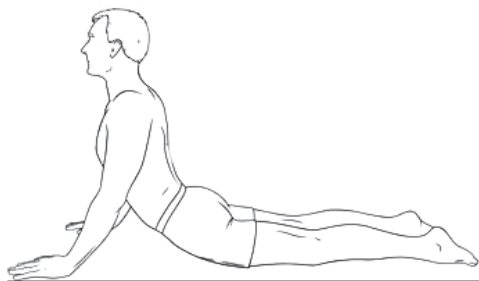
2024

(d) Shalabhasana
Shalabhasana, also known as the locust pose, involves lying prone and lifting the chest and legs simultaneously. It strengthens the back, glutes, and core muscles, improves posture, and enhances flexibility, making it identifiable and beneficial for physical stability for balance.

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3. Identify the asana shown in the picture given below and choose the correct option from the following :



- (a) Bhujangasana
- (b) Halasana
- (c) Vajrasana
- (d) Dhanurasana

Ans :

2023

- (a) Bhujangasana

Bhujangasana, commonly known as the cobra pose, involves arching the back while lying prone. It improves spinal flexibility, strengthens the back muscles, and opens the chest, thereby reducing stiffness and promoting overall vitality and well-being during practice, enhancing energy levels.

4. Which of the following asana is NOT used to cure Asthma ?

- (a) Tadasana
- (b) Dhanurasana
- (c) Parvatasana
- (d) Bhujangasana

Ans :

2023

- (a) Tadasana

Tadasana, or the mountain pose, is primarily a standing posture focusing on alignment and balance. It does not significantly involve respiratory system stimulation unlike other asanas, making it less effective for asthma management compared to poses that emphasize deep breathing.

5. A disease associated with respiratory tract is _____.

- (a) Asthma
- (b) Hypertension
- (c) Diabete
- (d) Obesity

Ans :

2021 C

- (a) Asthma

Asthma is a chronic respiratory condition characterized by inflammation and narrowing of the airways. It leads to breathing difficulties, wheezing, and shortness of breath, directly affecting the respiratory tract and requiring specific management and care in daily life.

6. Gomukhasana. Chakrasana and Matsyasana are helpful in curing which disease?

- (a) Diabetes
- (b) Backpain
- (c) Asthma
- (d) Obesity

Ans :

SQP 2020

- (c) Asthma

These asanas improve respiratory function by opening the chest and increasing lung capacity. Regular practice of Gomukhasana, Chakrasana, and Matsyasana enhances breathing efficiency, reduces airway constriction, and supports better oxygen flow, thereby alleviating symptoms for improved respiratory health.

7. Which asana is helpful in maintaining normal blood pressure?

- (a) Shavasana
- (b) Padmasana
- (c) Shalabhasana
- (d) Vakrasana

Ans :

COMP 2020

- (a) Shavasana

Shavasana, or corpse pose, is a relaxation posture that promotes calmness and reduces stress. It helps lower blood pressure by calming the nervous system, easing muscle tension, and allowing the mind and body to achieve a state of deep rest.

8. The benefit/s of shavasana is/are

- (a) It increases concentration power
- (b) It provides relaxation in High Blood Pressure
- (c) It is helpful in reducing stress.
- (d) All of these.

Ans :

2020 C

- (d) All of these

Shavasana enhances concentration, reduces stress, and promotes relaxation in individuals with high blood pressure. Its calming effects on the nervous system improve mental clarity, ease physical tension, and contribute to overall well-being, supporting both mind and body for balanced vitality.

9. Identify the Asana :



- (a) Pawanmuktasana
- (b) Sukhasana
- (c) Chakrasana
- (d) Gomukhasana

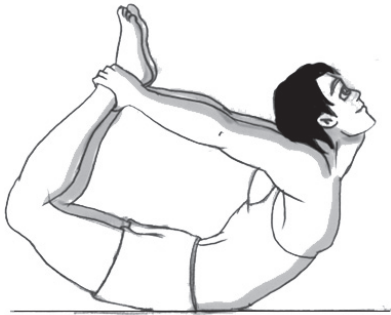
Ans :

2023-24

- (a) Pawanmuktasana

Pawanmuktasana, known as the wind-relieving pose, involves gentle abdominal compressions and deep breathing. This asana aids in digestion, releases trapped gas, and improves overall flexibility while providing a subtle massage to internal organs for enhanced bodily health, promoting optimal function.

10. Identify the asana:



- (a) Paschimottanasana
- (b) Halasana
- (c) Vajrasana
- (d) Dhanurasana

Ans :

2022-2023

- (d) Dhanurasana

Dhanurasana, also called the bow pose, involves lying prone and lifting the legs and chest simultaneously while holding the ankles. It stretches the entire front body, strengthens the back muscles, and improves overall flexibility and posture, boosting energy and balance.

11. Which asana is helpful in increasing height?

- (a) Sukhasana
- (b) Tadasana
- (c) Bhujangasana
- (d) Vajrasana

Ans :

2022-23

- (b) Tadasana

Tadasana, or the mountain pose, promotes correct posture and spinal alignment. By elongating the spine and engaging core muscles, it encourages a taller appearance and improved body balance, contributing to an overall impression of increased height, supporting natural growth effectively.

12. Which gland is associated with Diabetes?

- (a) Endocrine glands
- (b) Pituitary
- (c) Pancreas
- (d) Hypothalamus

Ans :

2023-24

- (c) Pancreas

The pancreas is the gland responsible for producing insulin, a hormone that regulates blood sugar levels. Dysfunction in the pancreas leads to improper insulin production, resulting in diabetes. Maintaining pancreatic health is crucial for blood sugar management and metabolic balance.

13. What causes Obesity?

- (a) Non-Activity
- (b) Smoking
- (c) Over indulgence in food
- (d) All of the above

Ans :

DELHI 2018

- (d) All of the above

Non-activity reduces energy expenditure, smoking disrupts metabolic functions, and overindulgence in food leads to excessive calorie intake. Together, these factors promote fat accumulation, resulting in obesity. All of the above are contributing causes.

14. Ushtrasana pose refers to :

- (a) Camel pose
- (b) Cow pose
- (c) Fish pose
- (d) Cobra pose

Ans :

OD 2020

- (a) Camel pose

Ushtrasana, known as Camel Pose, involves a deep backbend that stretches the chest and abdomen while opening the respiratory passages. Its posture mimics a camel's hump, thereby improving flexibility, enhancing posture, and energizing the body beneficially.

15. Which asana is of side twist pose ?

- (a) Shavasana
- (b) Chakrasana
- (c) Ardha Matsendrasana
- (d) Parvatasana

Ans :

FOREIGN 2017

- (c) Ardha Matsendrasana

Ardha Matsendrasana, or the half spinal twist, involves twisting the torso to one side, providing a lateral stretch. It improves spinal mobility,

stimulates digestion, and detoxifies the body, clearly making it a side twist pose practice.

- 16.** Which gland secretes the hormone insulin, the lack of which is associated with Diabetes?

(a) Endocrine glands
(b) Pituitary
(c) Pancreas
(d) Hypothalamus

Ans :

SQP 2009

(c) Pancreas

The pancreas produces insulin, a crucial hormone for regulating blood sugar levels. When insulin secretion is impaired, glucose uptake is compromised, leading to diabetes. Thus, the pancreas is central to maintaining metabolic balance and preventing diabetes.

- 17.** Katichakrasana is a

(a) standing asana
(b) Sitting asana
(c) Lying asana
(d) Balancing asana

Ans :

COMP 2006

(b) Sitting asana

Katichakrasana, the waist-turning pose, is performed while seated. It emphasizes twisting the spine, stimulating the digestive system, and improving flexibility. This seated posture is distinctively categorized as a sitting asana beneficial for detoxification and mobility.

- 18.** Bhujangasana is also known as

(a) Dog posture
(b) Child posture
(c) Cobra posture
(d) Reverse Boat posture

Ans :

DELHI 2001

(c) Cobra posture

Bhujangasana, or Cobra Pose, involves arching the back while lifting the chest, resembling a snake rising. This posture stretches the spine, strengthens back muscles, and enhances circulation, earning it the name "Cobra Pose" for its characteristic movement.

- 19.** Which asana can be suggested as preparatory asana for Pawanmuktasana

(a) Vajarasana
(b) Bhujangasana
(c) Matsyendrasana
(d) Naukasana

Ans :

OD 2004

(d) Naukasana

Naukasana, or Boat Pose, is an effective preparatory asana for Pawanmuktasana because it activates core muscles, strengthens the abdomen, and improves digestion. This pose primes the body for deeper abdominal work, ensuring a smooth transition to subsequent asanas.

- 20.** What causes an Asthma Attack?

(a) Allergy
(b) Smoke
(c) Exercise
(d) All of the above

Ans :

FOREIGN 2007

(d) All of the above

Asthma attacks can be triggered by allergens, smoke, and exercise. Each factor irritates the airways, leading to constriction and breathing difficulties. Consequently, all of the above are potential causes that can provoke an asthma attack.

- 21.** Poor exchange of oxygen and carbon dioxide in an individual is the result of

(a) exercise induced Asthma
(b) allergy induced Asthma
(c) Pulmonary Hypertension
(d) Respiratory Failure

Ans :

SQP 2003

(d) Respiratory Failure

Respiratory failure occurs when the lungs cannot efficiently exchange oxygen and carbon dioxide. This severe condition results in inadequate oxygen supply and retention of carbon dioxide, necessitating immediate medical attention to restore proper respiratory function and prevent life-threatening complications safely.

- 22.** Which asana is base asana for curing Asthma?

(a) Sukhasana
(b) Chakrasana
(c) Matsyasana
(d) Parvatasana

Ans :

COMP 2008

(a) Sukhasana

Sukhasana, the easy pose, is considered foundational for asthma relief. It encourages deep, mindful breathing, improves lung capacity, and reduces stress. This simple seated posture helps regulate respiratory function and enhances overall calmness in the practitioner.

23. What causes Hypertension?

- (a) Excessive insulin secretion
- (b) Smoke
- (c) Food
- (d) All of the above

Ans :

DELHI 2006

- (d) All of the above

Hypertension can be caused by a combination of factors including excessive insulin secretion, smoking, and poor dietary habits. Each of these factors increases blood pressure, raises vascular resistance, and adds cardiovascular strain, necessitating comprehensive lifestyle management to control hypertension.

24. In Uttanpadasana which is the correct pose:

- (a) Legs raised in supine position
- (b) Legs raised in prone position
- (c) Head raised in supine position
- (d) Head and led raised in prone position

Ans :

OD 2002

- (a) Legs raised in supine position

Uttanpadasana is practiced lying on the back with the legs elevated in a supine position. This posture strengthens the abdominal muscles and enhances blood circulation. It clearly involves raising the legs while the body remains supine, ensuring proper alignment.

25. Which asana is base asana for relaxation and mental repose?

- (a) Shavasana
- (b) Chakrasana
- (c) Halasan
- (d) Parvatasana

Ans :

FOREIGN 2010

- (a) Shavasana

Shavasana, or the corpse pose, is widely practiced for deep relaxation and mental repose. It allows the body to rest completely while calming the mind, reducing stress, and balancing the nervous system, which is essential for achieving overall mental well-being. Absolutely.

26. Which of the asana is for relaxation?

- (a) Makarasana
- (b) Bhadrasana
- (c) Ardh-Chakrasana
- (d) All of the above

Ans :

SQP 2012

- (a) Makarasana

Makarasana, known as the alligator pose, promotes relaxation by calming the nervous system and reducing stress. It encourages deep breathing and gentle stretching, allowing the body and mind to release tension and recover, making it highly effective for relaxation overall.

27. In Ardh Chakrasana which is the correct pose:

- (a) Back bend in standing position
- (b) Forward bend in standing position
- (c) Leg raised in sitting position
- (d) Head and led raised in lying position

Ans :

COMP 2005

- (a) Back bend in standing position

Ardha Chakrasana, or half wheel pose, is a standing back bend. It involves extending the arms overhead and gently arching the back while standing upright. This posture enhances flexibility, energizes the body, and is ideal for building vitality.

28. Which asana is base asana is not having back bend?

- (a) Tadasasana
- (b) Chakrasana
- (c) Bhujangasana
- (d) Ushtrasana

Ans :

DELHI 2011

- (a) Tadasana

Tadasana, or Mountain Pose, is a fundamental standing posture without any back bend. It focuses on proper alignment, balance, and grounding, enabling the practitioner to build strength and stability without the added strain of spinal extension found in back-bending asanas.

29. Assertion (A) : Tadasana is effective in obesity management as it improves posture and stimulates metabolism.

Reason (R) : The precise alignment in Tadasana directly reduces abdominal fat accumulation.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2013

- (c) A is true but R is false

Tadasana improves posture and supports metabolic activity, beneficial for obesity. However, while it contributes to overall body

toning, its direct effect on reducing abdominal fat is not specifically proven, making the reason an overstatement and thus false.

- 30. Assertion (A) :** Asanas like Bhujangasana and Shalabhasana help in diabetes management by enhancing insulin sensitivity and circulation.

Reason (R) : These postures activate abdominal and back muscles, which are solely responsible for regulating blood glucose levels.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2015

- (c) A is true but R is false

While yoga postures improve circulation and may enhance insulin sensitivity, they are not solely responsible for blood glucose regulation. Multiple factors contribute to glycemic control; hence, the reason oversimplifies the mechanism, rendering it false.

- 31. Assertion (A) :** Pranayama techniques such as Anuloma-Viloma and Kapalabhati can aid asthma management by improving respiratory efficiency.

Reason (R) : These breathing practices are contraindicated in asthma due to the risk of triggering bronchospasm.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2019

- (c) A is true but R is false

Controlled pranayama can enhance lung capacity and reduce stress in asthma patients when practiced correctly. Although some vigorous techniques may be risky, the appropriate forms (like Anuloma-Viloma) are beneficial, making the assertion true and the reason false.

- 32. Assertion (A) :** Modified asanas such as Tadasana, Uttanpadasana, and Shavasana are recommended for individuals with hypertension to promote calmness and vascular health.

Reason (R) : These asanas require vigorous effort, which elevates blood pressure temporarily and improves long-term cardiovascular performance.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2014

- (c) A is true but R is false

For hypertensive patients, modified, gentle asanas help reduce stress and improve circulation. However, the reason incorrectly emphasizes vigorous activity, which is not advised in hypertension, making it false despite the correctness of the assertion.

- 33. Assertion (A) :** Asanas like Ardha Chakrasana and Gomukhasana can alleviate back pain and arthritis by promoting spinal flexibility and reducing muscular tension.

Reason (R) : These postures are contraindicated in back pain because they overstress the vertebral column.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2016

- (b) Both A and R are true, but R is not the correct explanation for A

The assertion is valid as specific asanas improve flexibility and ease muscular tension in back pain and arthritis. The reason is partially misleading—while certain severe cases may avoid these postures, they are generally beneficial when performed correctly, so the reason does not adequately explain the assertion.

- 34. Assertion (A) :** The contraindications for many asanas vary with the condition; for example, certain postures beneficial for diabetes may be unsuitable for asthma.

Reason (R) : Each health condition requires a tailored yoga approach based on its unique pathophysiology and risk factors.

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- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2017

- (a) Both A and R are true, and R is the correct explanation for A

Asana contraindications indeed differ among conditions, necessitating individualized practices. The reason correctly identifies that distinct physiological factors and risk profiles require tailored yoga regimens, making both the assertion and reason true with the reason accurately explaining the assertion.

- 35. Assertion (A) :** Practices such as Nadi-Shodhana and Sitli Pranayama are beneficial across conditions like hypertension and asthma by promoting autonomic balance and reducing stress.

Reason (R) : Regulated breathing techniques improve parasympathetic activity, which can help moderate blood pressure and enhance respiratory control.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the correct explanation for A
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2009

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is correct because controlled breathing practices have been shown to balance autonomic function. The reason is also accurate, as these techniques increase parasympathetic activity, which contributes to lower blood pressure and improved respiratory efficiency, confirming both statements.

- 36. Assertion (A) :** Proper procedural execution of asanas such as Katichakrasana and Dhanurasana is essential to realize their benefits and avoid contraindications in various conditions.

Reason (R) : Incorrect posture during these asanas can lead to injury or exacerbate existing health issues.

- (a) Both A and R are true, and R is the correct explanation for A
- (b) Both A and R are true, but R is not the

correct explanation for A

- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2006

- (a) Both A and R are true, and R is the correct explanation for A

The assertion highlights the importance of correct procedure in achieving the therapeutic benefits of yoga, while the reason correctly identifies that poor form may cause injury or worsen conditions. Both statements are true and the reason properly supports the assertion.

- 37.** Which yoga posture is recommended for obesity management due to its benefits in improving posture and stimulating metabolism?

- (a) Katichakrasana
- (b) Tadasana
- (c) Matsyasana
- (d) Ushtrasana

Ans :

COMP 2001

- (b) Tadasana

Tadasana, also known as Mountain Pose, improves posture, enhances body alignment, and stimulates metabolic processes. Its controlled breathing and grounding stance help increase awareness and promote weight management for overall long-term health, making it ideal for obesity management.

- 38.** Which posture is beneficial for obesity because it stimulates abdominal organs and improves digestion?

- (a) Matsyasana
- (b) Halasana
- (c) Pavanmuktasana
- (d) Ardha-Matsyendrasana

Ans :

DELHI 2004

- (c) Pavanmuktasana

Pavanmuktasana, known as Wind-Relieving Pose, stimulates abdominal organs and improves digestion. It helps in weight management by enhancing metabolic function and promoting a healthy digestive system, aiding individuals managing obesity for overall long-term health.

- 39.** Which pranayama is effective for obesity management due to its deep breathing technique that boosts metabolism?

- (a) Kapalabhati
- (b) Suryabedhan pranayama
- (c) Nadi-Shodhana
- (d) Sitlipranayam

Ans :

OD 2007

(b) Suryabedhan pranayama

Suryabedhan pranayama emphasizes deep inhalation and exhalation, stimulating abdominal muscles and improving digestion. Its rhythmic breathing promotes metabolic balance, increases energy expenditure, and aids weight management for overall long-term health, making it highly beneficial for obesity.

40. Which forward bending posture improves digestion and alleviates obesity-related abdominal discomfort?

- (a) Ushtrasana
- (b) Pachimottanasana
- (c) Halasana
- (d) Katichakrasana

Ans :

FOREIGN 2003

(b) Pachimottanasana

Pachimottanasana, or Seated Forward Bend, stretches the back and abdominal muscles, thereby improving digestion and alleviating discomfort. It stimulates the digestive system, aids weight management, and reduces obesity-related symptoms, contributing to overall physical health every single day.

41. Which posture is recommended for diabetes management because it stimulates digestion and improves insulin sensitivity?

- (a) Shalabhasana
- (b) Bhujangasana
- (c) Dhanurasana
- (d) Mandukasana

Ans :

SQP 2008

(b) Bhujangasana

Bhujangasana, or Cobra Pose, is recommended for diabetes management as it stimulates the digestive system, improves insulin sensitivity, and aids blood sugar regulation. Its backbend opens the chest and promotes circulation, contributing to overall metabolic balance and improved health.

42. Which posture helps stimulate abdominal organs and regulate blood sugar in diabetic patients?

- (a) Dhanurasana
- (b) Shalabhasana
- (c) Supta-Vajrasana
- (d) Pavanmuktasana

Ans :

COMP 2006

(c) Supta-Vajrasana

Supta-Vajrasana, or Reclined Thunderbolt Pose, stimulates the abdominal organs, enhancing digestion and facilitating blood sugar regulation. Its gentle stretch improves insulin sensitivity and overall metabolic function, making it a valuable practice for diabetic patients to manage their condition well.

43. Which posture is beneficial for diabetic patients due to its stimulation of the pancreas and digestive regulation?

- (a) Mandukasana
- (b) Gomukasana
- (c) Yogmudra
- (d) Ushtrasana

Ans :

DELHI 2002

(a) Mandukasana

Mandukasana, known as Frog Pose, stimulates the abdominal region including the pancreas, enhancing digestive functions and metabolic regulation. This posture assists in maintaining balanced blood sugar levels and supports overall endocrine health, making it advantageous for managing diabetes effectively.

44. Which practice is contraindicated in diabetes due to its intense abdominal contractions?

- (a) Yogmudra
- (b) Kapalabhati
- (c) Ushtrasana
- (d) Ardha-Matsyendrasana

Ans :

OD 2010

(b) Kapalabhati

Kapalabhati, a forceful breathing exercise, is contraindicated in diabetes because its rapid, intense abdominal contractions may lead to elevated blood sugar fluctuations. This practice requires caution in diabetic patients to avoid potential metabolic imbalances and undue stress on the system.

45. Which pranayama is most beneficial for asthma due to its alternate nostril breathing technique?

- (a) Kapalabhati
- (b) Ujjayi
- (c) Anuloma-Viloma
- (d) Nadi-Shodhana

Ans :

FOREIGN 2012

(c) Anuloma-Viloma

Anuloma-Viloma pranayama, a type of alternate nostril breathing, enhances respiratory function, balances the autonomic nervous system, and clears

nasal passages. It helps reduce stress, improves oxygen intake, and promotes calm breathing, thereby supporting overall lung health.

46. Which posture opens the chest and improves lung capacity, benefiting asthma patients?

(a) Bhujangasana
(b) Matsyasana
(c) UttanMandukasana
(d) Vakrasana

Ans :

SQP 2015

(b) Matsyasana

Matsyasana, or Fish Pose, opens the chest, stretches the neck and throat, and improves lung capacity. This posture relieves respiratory congestion, enhances breathing efficiency, and supports overall respiratory health in asthma patients effectively.

47. Which posture, involving side bending and twisting, helps lower blood pressure in hypertensive patients?

(a) Uttanpadasana
(b) Ardha Halasana
(c) Katichakrasana
(d) Vakrasana

Ans :

COMP 2011

(c) Katichakrasana

Katichakrasana, or Waist Rotation Pose, involves side bending and twisting movements that relax the body and improve blood circulation. This practice helps lower blood pressure by reducing tension, promoting relaxation, and enhancing the functioning of the cardiovascular system efficiently.

48. Which breathing technique is recommended for managing hypertension due to its slow, deep breaths?

(a) Kapalabhati
(b) Ujjayi
(c) Nadi-Shodhana
(d) Sitlipranayam

Ans :

DELHI 2013

(d) Sitlipranayam

Sitlipranayam, a controlled breathing practice, is beneficial for hypertension as it promotes relaxation and reduces stress. By focusing on slow, deep breaths, it helps stabilize blood pressure, improves oxygenation, and supports a calm mental state, contributing positively to cardiovascular health.

49. Which pranayama balances the nervous system and is beneficial for hypertension management?

(a) Kapalabhati
(b) Nadi-Shodhana
(c) Anuloma-Viloma
(d) Sitlipranayam

Ans :

OD 2015

(b) Nadi-Shodhana

Nadi-Shodhana pranayama is recommended for hypertension management because it balances the nervous system, reduces stress, and promotes relaxation. This practice involves alternate nostril breathing, which helps lower blood pressure, improves mental focus, and supports overall cardiovascular and emotional well-being.

50. Which posture is recommended for back pain and arthritis due to its gentle back extension?

(a) Tadasana
(b) Urdhwahastottanasana
(c) Ardha Chakrasana
(d) Ushtrasana

Ans :

FOREIGN 2019

(c) Ardha Chakrasana

Ardha Chakrasana, or Half Wheel Pose, provides a gentle back extension that relieves tension and improves spinal flexibility. It strengthens supporting muscles and promotes proper alignment, thereby alleviating pain and reducing stiffness, ultimately enhancing overall functional mobility effectively.

51. Which posture is recommended for arthritis due to its gentle stretching and joint mobilization?

(a) Bhujangasana
(b) Gomukhasana
(c) Bhadrasana
(d) Makarasana

Ans :

SQP 2014

(c) Bhadrasana

Bhadrasana, known as Gracious Pose, involves gentle stretching and joint mobilization. It improves flexibility, reduces stiffness, and alleviates discomfort in affected joints. This posture promotes improved mobility and overall functional well-being, offering significant relief for arthritis symptoms.

- 52.** Which twisting posture is contraindicated for obese individuals due to potential knee strain?

(a) Matsyasana
(b) Halasana
(c) Ardha-Matsyendrasana
(d) Dhanurasana

Ans :

COMP 2016

(c) Ardha-Matsyendrasana

Ardha-Matsyendrasana, or Half Spinal Twist, may be contraindicated for obese individuals because the twisting motion can place excessive strain on the knees and lower back. This risk necessitates caution and modification when practiced safely by those with obesity concerns.

- 53.** Which posture is contraindicated in diabetic patients due to its intense abdominal compression?

(a) Ardha-Matsyendrasana
(b) Gomukhasana
(c) Ushtrasana
(d) Dhanurasana

Ans :

DELHI 2018

(d) Dhanurasana

Dhanurasana, or Bow Pose, is contraindicated in diabetic patients because its intense abdominal compression can impact digestion and blood sugar regulation. This pose may cause discomfort and stress on the abdominal organs, making it unsuitable for those with diabetes effectively.

- 54.** Which posture is contraindicated for asthma patients because its deep backbend compresses the chest?

(a) Bhujangasana
(b) Matsyasana
(c) UttanMandukasana
(d) Dhanurasana

Ans :

OD 2020

(d) Dhanurasana

Dhanurasana, or Bow Pose, is contraindicated for asthma patients due to its intense backbend that compresses the chest. Improper performance may exacerbate breathing difficulties, increase muscle tension, and worsen existing back issues, thereby significantly impacting overall daily functional capacity.

- 55.** Which pranayama enhances respiratory function in asthma through alternate nostril breathing?

(a) Kapalabhati
(b) Ujjayi
(c) Anuloma-Viloma

(d) Sitlipranayam

Ans :

SQP 2017

(c) Anuloma-Viloma

Anuloma-Viloma pranayama, a type of alternate nostril breathing, enhances respiratory function by balancing the autonomic nervous system and reducing bronchial constriction. It deepens oxygen intake, calms the mind, and promotes efficient lung function, thereby supporting overall respiratory health.

- 56.** Which inverted posture is contraindicated for severe hypertension due to increased cardiovascular strain?

(a) Makarasana
(b) Uttanpadasana
(c) Ardha Halasana
(d) Vakrasana

Ans :

COMP 2007

(b) Uttanpadasana

Uttanpadasana, or Extended Leg Pose, is contraindicated for individuals with severe hypertension because its inverted position can cause a surge in blood pressure. This risk of cardiovascular strain makes it unsuitable for those with high blood pressure concerns and conditions.

- 57.** Which forceful breathing technique is contraindicated in hypertension due to its vigorous exhalations?

(a) Kapalabhati
(b) Nadi-Shodhana
(c) Sitlipranayam
(d) Ujjayi

Ans :

DELHI 2010

(a) Kapalabhati

Kapalabhati, a forceful breathing technique, is contraindicated for individuals with hypertension because its vigorous exhalations may lead to elevated blood pressure levels. This practice places stress on the cardiovascular system, making it unsuitable for those managing high blood pressure effectively.

- 58.** Which posture is contraindicated for back pain because it places excessive strain on the spine?

(a) Tadasana
(b) Urdhwahastottanasana
(c) Bhujangasana
(d) Gomukhasana

Ans :

OD 2015

(b) Urdhwahastottanasana

Urdhwahastottanasana, or Upward Salute, can be contraindicated for individuals with back pain as it places excessive strain on the spine. Improper performance may exacerbate discomfort, increase muscle tension, and worsen existing back issues, thereby significantly impacting overall daily functional capacity.

59. Which posture involves a gentle backbend that relieves lower back tension in individuals with back pain?

- (a) Tadasana
- (b) Urdhwahastottanasana
- (c) Bhujangasana
- (d) Gomukhasana

Ans :

FOREIGN 2018

(c) Bhujangasana

Bhujangasana, or Cobra Pose, involves a gentle backbend that relieves lower back tension. It stretches the spine, strengthens the back muscles, and improves posture. This pose is recommended for alleviating back pain and arthritis symptoms, promoting flexibility and reducing stiffness.

60. Which posture enhances spinal flexibility and relieves joint tension, aiding arthritis management?

- (a) Makarasana
- (b) Nadi-Shodhana
- (c) Bhujangasana
- (d) Gomukhasana

Ans :

SQP 2009

(d) Gomukhasana

Gomukhasana, or Cow Face Pose, enhances spinal flexibility and relieves joint tension. It is recommended for arthritis management as it gently stretches the back and shoulders, improves posture, and reduces stiffness, thereby promoting joint mobility and musculoskeletal balance effectively.

61. Which pranayama is used to reduce stress and alleviate arthritis symptoms in the back?

- (a) Kapalabhati
- (b) Ujjayi
- (c) Nadi-Shodhana pranayama
- (d) Bhadrasana

Ans :

COMP 2003

(c) Nadi-Shodhana pranayama

Nadi-Shodhana pranayama, or alternate nostril breathing, is effective in reducing stress and alleviating arthritis symptoms by calming

the nervous system. It enhances oxygenation, improves circulation, and promotes relaxation, thereby reducing pain and stiffness in the back for benefit.

62. Which twisting posture is contraindicated for obese individuals due to excessive strain on the knees?

- (a) Matsyasana
- (b) Halasana
- (c) Ardha-Matsyendrasana
- (d) Dhanurasana

Ans :

DELHI 2012

(c) Ardha-Matsyendrasana

Ardha-Matsyendrasana, or Half Spinal Twist, may be contraindicated for obese individuals because the twisting motion can place excessive strain on the knees and lower back. This risk necessitates caution and possible modification when practiced safely by those with obesity concerns.

63. Which posture is contraindicated in diabetic patients due to its intense abdominal compression?

- (a) Ardha-Matsyendrasana
- (b) Gomukhasana
- (c) Ushtrasana
- (d) Dhanurasana

Ans :

OD 2019

(d) Dhanurasana

Dhanurasana, or Bow Pose, is contraindicated in diabetic patients because its intense abdominal compression can impact digestion and blood sugar regulation. This pose may cause discomfort and stress on the abdominal organs, making it unsuitable for those with diabetes effectively.

64. Which posture is particularly beneficial for asthma patients by opening the chest and improving lung capacity?

- (a) Bhujangasana
- (b) Matsyasana
- (c) Urdhwahastottanasana
- (d) UttanMandukasana

Ans :

FOREIGN 2020

(b) Matsyasana

Matsyasana, or Fish Pose, opens the chest, stretches the neck and throat, and improves lung capacity. This posture relieves respiratory congestion, enhances breathing efficiency, and supports overall respiratory health in asthma patients, thereby improving lung function effectively.

65. Which posture is recommended for diabetic patients due to its ability to improve metabolic rate and stimulate the endocrine system?

(a) Ushtrasana
(b) Yogmudra
(c) Dhanurasana
(d) Pavanmuktasana

Ans :

SQP 2001

(a) Ushtrasana

Ushtrasana, or Camel Pose, helps improve metabolic rate and stimulates the endocrine system. It opens the chest, enhances digestion, and improves insulin sensitivity, thereby supporting balanced blood sugar levels and overall metabolic health in diabetic patients every single day.

66. Which posture is contraindicated in diabetic patients because its intense abdominal compression may affect digestion?

(a) Bhujangasana
(b) Shalabhasana
(c) Paschimottanasana
(d) Dhanurasana

Ans :

COMP 2006

(d) Dhanurasana

Dhanurasana, or Bow Pose, is contraindicated in diabetic patients because its intense abdominal compression can impact digestion and blood sugar regulation. This pose may cause discomfort and stress on the abdominal organs, making it unsuitable for those with diabetes effectively.

67. Which posture is beneficial for obesity management by opening the chest, stimulating abdominal organs, and improving digestive function?

(a) Matsyasana
(b) Halasana
(c) Ushtrasana
(d) Katichakrasana

Ans :

DELHI 2011

(a) Matsyasana

Matsyasana opens the chest, stimulates abdominal organs, improves digestive function, and increases metabolic activity. It relieves tension, reduces stress, and promotes better posture. Regular practice enhances weight management while improving respiratory and cardiovascular functions beneficially.

68. Which practice is beneficial for diabetic patients by reducing stress and enhancing insulin sensitivity?

(a) Yogmudra
(b) Dhanurasana
(c) Mandukasana
(d) Kapalabhati

Ans :

OD 2014

(a) Yogmudra

Yogmudra is a calming hand gesture practice that reduces stress, promotes mental relaxation, and improves balance in diabetic patients. It assists in regulating the nervous system, supports better insulin sensitivity and metabolic function, and contributes to improved blood sugar control effectively.

69. Which practice is contraindicated in asthma patients due to its forceful, rapid exhalations?

(a) Anuloma-Viloma
(b) Urdhwahastottanasana
(c) Kapalabhati
(d) Gomukhasana

Ans :

FOREIGN 2004

(c) Kapalabhati

Kapalabhati involves forceful, rapid exhalations that may irritate the airways in asthma patients. This vigorous technique can worsen bronchial constriction and induce respiratory distress, making it contraindicated for individuals with asthma who require gentle, controlled breathing exercises and ensuring safety.

70. Which posture is highly beneficial for hypertension by promoting deep relaxation and reducing stress?

(a) Shavasana
(b) Uttanpadasana
(c) Katichakrasana
(d) Makarasana

Ans :

SQP 2002

(a) Shavasana

Shavasana, or Corpse Pose, promotes deep relaxation by calming the nervous system and reducing stress. It helps lower blood pressure by inducing a meditative state and improving circulation, making it particularly beneficial for individuals with hypertension for overall cardiovascular health.

71. Which posture is recommended for back pain due to its ability to improve posture, align the spine, and strengthen core muscles?

(a) Tadasana
(b) Urdhwahastottanasana
(c) Gomukhasana
(d) Bhadrasana

Ans :

COMP 2013

(a) Tadasana

Tadasana, or Mountain Pose, is beneficial for back pain as it improves posture, aligns the spine, and strengthens core muscles. This simple standing pose relieves tension, increases body awareness, and promotes better balance, thereby reducing back discomfort significantly.

- 72.** Which posture is beneficial for diabetic patients by stimulating the abdominal region, including the pancreas?

(a) Mandukasana
(b) Gomukhasana
(c) Ushtrasana
(d) Pavanmuktasana

Ans :

DELHI 2016

(a) Mandukasana

Mandukasana, or Frog Pose, is beneficial for diabetic patients as it stimulates the abdominal region, including the pancreas. This stimulation enhances digestive function, improves metabolic regulation, and potentially improves insulin sensitivity, thereby supporting better overall blood sugar control when practiced regularly.

- 73.** Which posture is useful for obesity management by stretching the spine, improving digestion, and stimulating abdominal organs?

(a) Halasana
(b) Matsyasana
(c) Ushtrasana
(d) Pavanmuktasana

Ans :

OD 20009

(a) Halasana

Halasana, or Plow Pose, benefits obesity management by stretching the spine, improving digestion, and stimulating abdominal organs. It enhances metabolic activity, promotes detoxification, and increases blood circulation, significantly contributing to weight management and overall well-being.

- 74.** Which posture benefits asthma patients by opening the chest and improving lung function through gentle twisting?

(a) Vakrasana
(b) Dhanurasana
(c) Bhujangasana
(d) Matsyasana

Ans :

FOREIGN 2003

(a) Vakrasana

Vakrasana, or Twisting Pose, benefits asthma patients by opening the chest and improving lung function. It gently massages the abdominal organs, enhances respiratory efficiency, and facilitates easier breathing, thereby alleviating congestion and promoting calm, improved respiratory capacity.

- 75.** Which posture is recommended for hypertension as it opens the chest, calms the mind, and improves circulation?

(a) Sarala Matyasana
(b) Tadasana
(c) Ardha Halasana
(d) Gomukhasana

Ans :

SQP 2012

(a) Sarala Matyasana

Sarala Matyasana, or Gentle Fish Pose, benefits individuals with hypertension by opening the chest, calming the mind, and promoting relaxation. It improves circulation and reduces stress levels, thereby helping lower blood pressure and maintain cardiovascular balance during daily activities.

- 76.** Which posture relieves back pain by enhancing spinal flexibility, stretching muscles, and reducing shoulder tension?

(a) Gomukhasana
(b) Tadasana
(c) Bhujangasana
(d) Urdhwahastottanasana

Ans :

COMP 2019

(a) Gomukhasana

Gomukhasana, or Cow Face Pose, relieves back pain by enhancing spinal flexibility and reducing shoulder tension. It stretches and strengthens muscles, improves posture and alleviates discomfort, making it valuable for individuals suffering from pain, effectively daily.

- 77.** Which of the following yoga poses is depicted in the illustration?



- (a) Bhadrasana (Gracious Pose)
- (b) Padmasana (Lotus Pose)
- (c) Vajrasana (Thunderbolt Pose)
- (d) Sukhasana (Easy Pose)

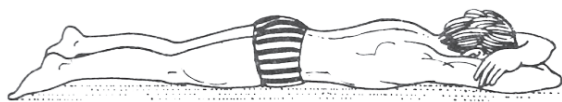
Ans :

DELHI 2020

- (a) Bhadrasana (Gracious Pose)

Bhadrasana, also known as the Gracious Pose, features a seated posture with feet pressed together and knees opened, encouraging an upright spine. It promotes hip flexibility, calm focus and stability in meditation, truly differentiating it from Lotus and Thunderbolt poses.

78. Which of the following yoga poses is depicted in the illustration?



- (a) Dhanurasana (Bow Pose)
- (b) Bhujangasana (Cobra Pose)
- (c) Makarasana (Crocodile Pose)
- (d) Shalabhasana (Locust Pose)

Ans :

OD 2006

- (c) Makarasana (Crocodile Pose)

Makarasana (Crocodile Pose) involves lying prone with arms folded under the forehead. It relieves lower back strain and promotes diaphragmatic breathing. The legs remain relaxed, supporting a gentle spinal alignment. This pose soothes the nervous system and fosters deeper relaxation.

79. Which of the following yoga poses is depicted in the illustration?



- (a) Uttanasana (Standing Forward Bend)
- (b) Ardha Chakrasana (Half Wheel Pose)
- (c) Trikonasana (Triangle Pose)
- (d) Dhanurasana (Bow Pose)

Ans :

FOREIGN 2008

- (b) Ardha Chakrasana (Half Wheel Pose)

Ardha Chakrasana is a mild backbend, performed by standing upright and bending backward from the waist with arms extended overhead. It strengthens the spine, opens the chest, and improves posture. This pose invigorates energy flow, enhancing overall flexibility and balance.

80. Which of the following yoga poses is depicted in the illustration?



- (a) Sarala Matsyasana (Easy Fish Pose)
- (b) Savasana (Corpse Pose)
- (c) Setu Bandhasana (Bridge Pose)
- (d) Bhujangasana (Cobra Pose)

Ans :

SQP 2005

- (a) Sarala Matsyasana (Easy Fish Pose)

Sarala Matsyasana is a gentler variation of Fish Pose, lying supine with chest elevated and neck relaxed. It broadens the chest, facilitates deeper breathing, and gently stretches the spine. This posture supports heart-opening benefits without intense arching or joint strain.

81. Match the asana in List-I with its common English name/pose in List-II.

	List-I (Asana)		List-II (Pose)
(a)	Bhujangasana	(i)	Bow Pose
(b)	Dhanurasana	(ii)	Cobra Pose
(c)	Ushtrasana	(iii)	Palm Tree Pose
(d)	Tadasana	(iv)	Camel Pose

Select the correct option from the following:

- (A) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
- (B) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
- (C) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
- (D) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)

Ans :

COMP 2014

- (C) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Bhujangasana is the Cobra Pose, Dhanurasana is the Bow Pose, Ushtrasana is the Camel Pose and Tadasana is the Palm Tree Pose.

- 82.** Match the lifestyle disease in List-I with a recommended asana from List-II.

List-I (Disease)			List-II (Asana)
(a)	Asthma	(i)	Mandukasana
(b)	Diabetes	(ii)	Shavasana
(c)	Hypertension	(iii)	Urdhwahastottasana
(d)	Back Pain	(iv)	Ardha-Chakrasana

Select the correct option from the following:

- (A) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 (B) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
 (C) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
 (D) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

Ans :

DELHI 2001

(A) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 Urdhwahastottasana helps increase lung capacity for Asthma. Mandukasana is beneficial for Diabetes. Shavasana is beneficial for Hypertension. Ardha-Chakrasana helps relieve Back Pain.

- 83.** Match the asana in List-I with its specific benefit mentioned in List-II.

List-I (Asana)			List-II (Benefit)
(a)	Pavan-muktasana	(i)	Known as the “wind removing asana.”
(b)	Gomukhasana	(ii)	Tones and strengthens the entire spinal extensor group of back muscles.
(c)	Shalabhasana	(iii)	Enables greater flexibility of the hip joint.
(d)	Bhujangasana	(iv)	Strengthens back and neck muscles.

Select the correct option from the following:

- (A) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 (B) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (C) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
 (D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

Ans :

OD 2006

(A) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 Pavanmuktasana is known as the “wind removing asana”. Gomukhasana improves hip joint flexibility. Shalabhasana strengthens the back and neck muscles. Bhujangasana strengthens the spinal extensor muscles.

- 84.** Match the asana in List-I with its contraindication mentioned in List-II.

	List-I (Asana)		List-II (Contraindication)
(a)	Katichakrasana	(i)	Avoid in case of Migraine.
(b)	Halasana	(ii)	Avoid in case of Hernia.
(c)	Tadasana	(iii)	Avoid if suffering from Slipped Disc.
(d)	Supta-Vajrasana	(iv)	Avoid if suffering from Cervical Spondylitis.

Select the correct option from the following:

- (A) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
 (B) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
 (C) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
 (D) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Ans :

FOREIGN 2011

(D) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 The contraindications are specifically matched to each asana. For Katichakrasana, one should avoid it with a hernia. For Halasana, it's contraindicated for cervical spondylitis. For Tadasana, it should be avoided by those with migraines. For Supta-Vajrasana, it is contraindicated for a slipped disc.

- 85.** Match the pranayama in List-I with its key technique mentioned in List-II.

	List-I (Pranayama)		List-II (Technique)
(a)	Surya-bhedhana	(i)	Inhale through a cylindrically shaped tongue.
(b)	Sheetali	(ii)	Inhale through the right nostril and exhale through the left.
(c)	Nadi-Shodhana	(iii)	Forceful exhalation by contracting the abdomen.
(d)	Kapalbhati	(iv)	Also known as Alternate Nostril Breathing.

Select the correct option from the following:

- (A) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
 (B) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (C) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
 (D) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)

Ans :

SQP 2020

(B) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Each pranayama has a unique technique. Suryabhedhana involves inhaling through the right nostril and exhaling through the left. Sheetali involves inhaling through a rolled tongue. Nadi-Shodhana is known as Alternate Nostril Breathing. Kapalbhathi involves forceful exhalation.

NODIA

3. It massages the internal organs, promoting the secretion of essential enzymes.
4. It aids in expelling trapped gas from the stomach.

Write the benefits and contraindications of Matsyasana.

Ans :

Term-II, 2021-22

This posture has therapeutic value for mild backache and fatigue.

1. It exercises the muscles in the throat region.
 2. The posture gives very gentle exercise to the spine and makes the body flexible.
 3. It reduces anxiety and brings the sense of well-being.
 4. It improves the breathing functions.
- Avoid practicing the asana in case of peptic ulcers, heart disease, hernia and problems in back.

TWO MARKS QUESTIONS

86. "Asanas can be used as preventive measures." Comment.

Ans :

Term-II, 2021-22

Asanas serve as an effective preventive measure by aiding in the management and cure of various diseases such as asthma, hypertension, diabetes, and back pain. They contribute significantly to both mental and physical well-being by providing stability and comfort. Additionally, asanas support cardiac and respiratory health, strengthen body muscles, alleviate stress, and promote emotional balance.

87. What is the role of Yoga in preventing lifestyle diseases ?

Ans :

2020 C, AI 2019

Yoga enhances flexibility, reduces stress, and boosts confidence, ultimately leading to a healthier lifestyle. It is beneficial in managing lifestyle diseases such as obesity, diabetes, asthma, hypertension, and back pain. With regular yoga practice:

1. Bones and joints become stronger.
2. Muscles gain strength and flexibility.
3. Blood circulation normalizes.
4. Respiratory efficiency improves.
5. Digestive system function increases.
6. Neuromuscular coordination is enhanced.
7. The immune system is fortified.

88. Enlist any four benefits of Pawanmuktasana.

Ans :

Term-II, 2021-22 C

Pawanmuktasana provides several key benefits:

1. It enhances digestive system function.
2. It alleviates constipation by stimulating the abdominal region.

90. According to syllabus, suggest any four asanas for curing 'diabetes'.

Ans :

2021 C

For managing diabetes, the syllabus recommends the following practices:

1. Bhujangasana (Cobra Pose)
2. Yogmudra
3. Kapalbhathi
4. Nadi-Shodhana Pranayama

These asanas and pranayama techniques are designed to stimulate internal organs, improve circulation, enhance metabolic activity, and balance the nervous system, thereby supporting better blood sugar regulation.

91. Explain two benefits of "Ardha matsyendra" asana.

Ans :

Delhi 2019

Benefits of Ardha Matsyendrasana include:

1. It improves the stretching capability of the back muscles.
2. It aids in preventing digestive disorders.
3. It helps stimulate proper heart function.
4. It balances the secretion of various glands.
5. It is beneficial in treating conditions such as sinusitis, bronchitis, constipation, menstrual irregularities, urinary tract issues, and cervical spondylitis.
6. It provides relief from fatigue, sciatica, and back pain.

92. Enlist four asanas those help to control asthma.

Ans :

2024

Four asanas that aid in controlling asthma are:

1. Tadasana (Mountain Pose)
2. Uttan Mandukasana (Modified Frog Pose)
3. Vakrasana (Twisted Pose)
4. Bhujangasana (Cobra Pose)

93. What is the main physiological cause of Asthma?

Ans :

COMP 2018

Asthma is a lung condition characterized by swelling of the airways and excessive mucus production. This results in blocked or narrowed air passages, making breathing difficult. The condition may be triggered by genetic factors or allergies.

94. According to syllabus, suggest any four asanas for curing 'Hypertension'.

Ans :

2021 C

For managing hypertension, the recommended practices are:

1. Shavasana (Corpse Pose)
2. Uttanpadasana (Leg Extension Pose)
3. Gomukhasana (Cow Face Pose)
4. Nadi-shodhana Pranayama (Alternate Nostril Breathing)

95. What is 'Hypertension'?

Ans :

DELHI 2018

Hypertension refers to high blood pressure, a condition where the force of blood pressing against the walls of the arteries is excessively high.

96. "Now-a-days yoga plays a very important role in cure of various diseases". Justify the statement by giving suitable examples of asanas for Hypertension.

Ans :

The statement is accurate. Asanas can help treat many diseases such as hypertension, asthma, and diabetes while enhancing overall health. For instance, Tadasana benefits those with hypertension and obesity by reducing muscular stress, improving body alignment, and strengthening the thighs, knees, and ankles. Similarly, Uttanpadasana aids digestion, promotes weight loss, increases blood circulation, reduces belly fat, and is also suitable for relieving back pain.

97. Explain any two benefits of ardha matsyendrasana.

Ans :

Term-II 2021-22

Benefits of Ardha Matsyendrasana include:

1. It helps shed excess fat, contributing to a more toned and robust body.
2. It stimulates the liver, spleen, and pancreas.
3. It supports and improves respiratory health.
4. It strengthens the spinal column and back muscles.
5. It enhances facial radiance and helps regulate the menstrual cycle in women.
6. It rejuvenates the surrounding nerves.
7. It alleviates back pain, stress, and headaches.
8. It is beneficial for individuals managing diabetes.

98. Describe the procedure, benefits, and contraindications of Tadasana for obesity management.

Ans :

1. Procedure: Stand with feet together or slightly apart, weight evenly distributed. Lengthen the spine, relax the shoulders, and raise the arms overhead with palms facing inward. Maintain steady, deep breathing throughout.
2. Benefits: Enhances body awareness, improves posture, increases circulation, and helps in weight management by engaging core and leg muscles.
3. Contraindications: Not recommended for individuals with severe hypotension or balance disorders, and caution is advised if there are recent lower-limb injuries.

99. Explain the procedure, benefits, and contraindications of Katichakrasana for obesity.

Ans :

OD 2004

1. Procedure: Sit with legs extended. Twist the torso gently to one side by placing the opposite hand on the knee and the other hand behind. Keep the spine elongated and maintain deep, rhythmic breathing.
2. Benefits: Stimulates abdominal organs, improves digestion, and aids in detoxification; the twisting motion can help tone the waist and reduce abdominal fat.
3. Contraindications: Avoid if you have severe back pain, spinal injuries, or if the twist causes discomfort in the abdominal region.

100. Detail the procedure, benefits, and contraindications for Pawanmuktasana in obesity management.

Ans :

FOREIGN 2002

1. Procedure: Lie on your back. Bring one knee toward the chest while keeping the other leg extended; alternate sides or bring both knees together. Gently press the lower back into the floor while breathing steadily.
2. Benefits: Aids digestion and relieves gas, stimulates abdominal organs, and helps in toning the core muscles, which can assist in weight loss.
3. Contraindications: Not advised for those with severe hernias, acute abdominal pain, or recent abdominal surgery.

101. Outline the procedure, benefits, and contraindications of Matsyasana for obesity management.

Ans : SQP 2013

1. Procedure : Lie on your back, tuck the legs slightly, and slide your hands under the buttocks. Lift the chest by arching the upper back while gently tilting the head back. Keep the legs relaxed and maintain smooth, deep breaths.
2. Benefits : Opens the chest and throat, improves respiratory efficiency, stimulates the abdominal organs, and can help in reducing weight by promoting better metabolism.
3. Contraindications : Should be avoided by those with neck injuries, severe back problems, or high blood pressure, as the head tilt might cause discomfort.

102. Discuss Dhanurasana (Bow Pose) in the context of obesity: procedure, benefits, and contraindications.

Ans : COMP 2016

1. Procedure: Lie prone on the mat. Bend the knees, reach back to grasp the ankles, and lift the chest and thighs off the ground simultaneously, forming a bow shape. Keep the head in a neutral position, looking slightly upward, and breathe steadily.
2. Benefits: Strengthens the back muscles and core, improves flexibility of the spine, stimulates the abdominal organs, and can boost metabolism to aid in weight loss.
3. Contraindications: Not recommended for individuals with low back injuries, pregnancy, or those who experience severe discomfort during back bending.

103. For diabetic patients, explain the procedure, benefits, and contraindications of Katichakrasana.

Ans : DELHI 2017

1. Procedure: From a seated position with legs extended, rotate the torso gently to one side, using the opposite hand to support the twist. Keep the spine straight and breathe slowly.
2. Benefits: Enhances insulin sensitivity by stimulating the abdominal region, improves digestion, and may aid in stabilizing blood sugar levels through improved circulation.
3. Contraindications: Not advisable for those with severe spinal issues, uncontrolled blood pressure, or if the twisting causes abdominal discomfort.

104. Describe Pawanmuktasana for diabetes management, including procedure, benefits, and contraindications.

Ans : OD 2007

1. Procedure : Lie on your back and bring one knee at a time towards the chest, or both simultaneously, while gently pressing the lower back to the floor. Maintain slow and controlled breathing.
2. Benefits: Stimulates the digestive system, helps regulate metabolism, and may support better glycemic control by encouraging efficient energy utilization.
3. Contraindications : Avoid if you have acute abdominal pain, recent surgery, or hernias, as the pressure may exacerbate these conditions.

105. Outline the procedure, benefits, and contraindications of Bhujangasana (Cobra Pose) in diabetic management.

Ans : FOREIGN 2010

1. Procedure: Lie prone with palms placed under the shoulders. Slowly lift the chest off the ground by engaging the back muscles while keeping the lower body relaxed.
2. Benefits: Opens up the chest, stimulates the pancreas and other abdominal organs, and improves blood circulation, which may help in regulating blood sugar levels.
3. Contraindications: Not recommended for those with severe back pain, pregnancy, or recent abdominal surgery, as the back-bending movement may strain these areas.

106. Explain the procedure, benefits, and contraindications of Shalabhasana (Locust Pose) for diabetes.

Ans : SQP 2015

1. Procedure: Lie on your stomach with arms extended alongside the body. Lift the head, chest, and legs off the floor simultaneously, engaging the lower back muscles, while keeping the neck in a neutral position.
2. Benefits: Strengthens the back and core muscles, stimulates the digestive system, and improves overall metabolism, contributing to better blood sugar control.
3. Contraindications: Contraindicated for those with severe low back injuries or neck problems, as the pose puts stress on these areas.

107. Discuss Kapalabhati pranayama for diabetes management: procedure, benefits, and contraindications.

Ans : COMP 2018

1. Procedure : Sit comfortably with an erect spine. Perform rapid, forceful exhalations followed by passive inhalations, focusing on quick abdominal contractions. Begin slowly and build up speed gradually.
2. Benefits : Helps detoxify the body, improves respiratory and digestive functions, and may enhance metabolic rate, which can be beneficial in maintaining blood sugar balance.
3. Contraindications : Not advised for individuals with high blood pressure, hernia, or acute respiratory issues, as the forceful exhalations may cause strain.

108. Detail the procedure, benefits, and contraindications of Tadasana for individuals with asthma.

Ans : DELHI 2009

1. Procedure: Stand upright with feet shoulder-width apart, arms relaxed by the sides. Inhale deeply while lifting the arms gently overhead, and exhale slowly as you lower them back down.
2. Benefits: Improves posture and lung capacity, aids in deep breathing practices, and helps in relaxing the body, which can reduce stress—a common trigger for asthma.
3. Contraindications: Generally safe, but caution is advised for those with balance issues or acute respiratory distress during flare-ups.

109. Explain UttanMandukasana for asthma: procedure, benefits, and contraindications.

Ans : OD 2003

1. Procedure: Begin in a seated position with legs extended. Lean forward slowly, aiming to rest the chest on the thighs while keeping the back straight. Breathe slowly and deeply as you hold the posture.
2. Benefits: Opens up the chest and increases lung capacity, which can improve respiratory efficiency and help manage asthma symptoms by reducing airway constriction.
3. Contraindications: Not suitable for individuals with severe lower back pain or knee injuries, as the forward bend may aggravate these conditions.

110. Describe Bhujangasana (Cobra Pose) for managing asthma, including procedure, benefits, and contraindications.

Ans : FOREIGN 2012

1. Procedure: Lie face down with hands placed under the shoulders. Press into the floor and gently lift the chest by engaging the back muscles, keeping elbows close to the body.
2. Benefits: Opens up the chest, enhances lung capacity, and improves blood flow to the respiratory system. This posture can also relieve tension in the upper body, aiding easier breathing.
3. Contraindications: Avoid if you have severe back injuries or are pregnant, as the back extension can place excessive strain on the spine.

111. Outline the procedure, benefits, and contraindications of Kapalabhati pranayama for asthma management.

Ans : SQP 2019

1. Procedure: Sit in a comfortable, upright position. Rapidly exhale forcefully using the abdominal muscles while allowing passive inhalations. Start at a slow pace and gradually increase the rhythm.
2. Benefits: Clears the respiratory passages, improves lung capacity, and stimulates the respiratory system, which can be particularly beneficial in reducing asthma symptoms when practiced carefully.
3. Contraindications: Not recommended during an acute asthma attack or for individuals

with severe hypertension, as the forceful exhalations may lead to discomfort.

- 112.** Compare the procedure, benefits, and contraindications of Anuloma-Viloma (Alternate Nostril Breathing) with Matsyasana for asthma management.

Ans :

COMP 2001

1. Anuloma-Viloma:
 - i. Procedure: Sit comfortably and use the thumb and ring finger to alternately close one nostril at a time while breathing in and out in a slow, rhythmic pattern.
 - ii. Benefits: Balances the autonomic nervous system, reduces stress, and improves respiratory control, which is vital in managing asthma.
 - iii. Contraindications: Generally safe; however, individuals with severe nasal congestion or acute sinus infections should practice with caution.
2. Matsyasana:
 - i. Procedure: Lie on your back, slide your hands under your hips, lift the chest by arching the upper back, and gently tilt the head backward to open the throat.
 - ii. Benefits: Opens the chest and throat, potentially easing breathing, and stimulates the respiratory system.
 - iii. Contraindications: Not recommended for those with neck injuries or high blood pressure due to the backward head tilt, which might worsen symptoms.

- 113.** For hypertension management, detail the procedure, benefits, and contraindications of Tadasana.

Ans :

DELHI 2006

1. Procedure: Stand with feet parallel and hip-width apart, relax the shoulders, and engage the core. Inhale deeply while raising the arms overhead, then exhale while lowering them slowly.
2. Benefits: Promotes relaxation, improves circulation, and fosters a sense of grounded stability; these factors can help lower stress levels and contribute to better blood pressure regulation.
3. Contraindications: Generally safe, though those with severe balance issues or recent orthopedic injuries should practice with caution.

- 114.** Describe Uttanpadasana for hypertension: procedure, benefits, and contraindications.

Ans :

OD 2011

1. Procedure: From a standing position, raise one leg at a time in a controlled manner while maintaining a stable core and upright posture. Focus on balanced breathing and smooth transitions.
2. Benefits: Enhances lower body circulation and strengthens the core, which can indirectly support blood pressure control through improved overall circulation and relaxation.
3. Contraindications: Not advised for individuals with significant knee or hip joint problems, as lifting the leg might place undue stress on those areas.

- 115.** Explain the procedure, benefits, and contraindications of Nadi-shodhana pranayama for hypertension management.

Ans :

FOREIGN 2014

1. Procedure: Sit in a comfortable position. Close one nostril with your finger, inhale deeply through the open nostril, then switch and exhale through the other nostril. Continue alternating in a slow, rhythmic manner.
2. Benefits: Balances the nervous system, reduces stress and anxiety, and promotes relaxation—factors that can help lower blood pressure over time.
3. Contraindications: Generally safe; however, individuals with severe respiratory issues or acute nasal congestion should consult a professional before practice.

- 116.** For back pain and arthritis, outline the procedure, benefits, and contraindications of Urdhwahastottanasana (Upward Salute).

Ans :

SQP 2004

1. Procedure : Stand with feet together or hip-width apart. Inhale while raising the arms overhead, stretching the entire body upward, and gently arching the back. Hold briefly while maintaining steady breathing, then exhale to lower the arms.
2. Benefits: Increases spinal flexibility, relieves tension in the back muscles, and improves posture; these effects can reduce discomfort associated with back pain and arthritis.
3. Contraindications: Not recommended for those with severe spinal disc issues or acute

back injuries, as the arching motion may exacerbate pain.

- 117.** Discuss Gomukhasana (Cow Face Pose) for managing back pain and arthritis, including its procedure, benefits, and contraindications.

Ans :

COMP 2002

1. Procedure: Sit with legs extended. Cross one leg over the other so that both knees stack vertically. Reach one arm overhead and the other from behind to clasp the hands together; keep the spine straight and relax the shoulders.
2. Benefits: Stretches and strengthens the upper back, shoulders, and hips, helping to relieve tension and improve joint mobility. It can reduce stiffness and discomfort associated with arthritis and chronic back pain.
3. Contraindications: Avoid if there is severe knee, hip, or shoulder injury. Modify the pose or use props if full expression causes discomfort or strain.

THREE MARKS QUESTIONS

- 118.** Discuss the asanas helpful for a person suffering from Hypertension. Write down the procedure and contraindications of Sarala Matsyasana in detail.

Ans :

2023-24

Hypertension Management Asanas : Tadasana, Katichakrasana, Uttanpadasana, Ardha Halasana, Sarla Matyasana, Gomukhasana, Uttan Mandukasana, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-Shodhana Pranayama, and Sitlipranayam.

Sarala Matsyasana :

1. Technique :
 - i. Lie down flat on your back.
 - ii. Using your hands for support, ensure that the crown of your head touches the mat.
 - iii. As a result, your neck, upper back, and shoulders will lift slightly off the ground.
 - iv. Relax your arms by your sides and extend your toes.
 - v. Maintain this position for 30 seconds before releasing.
2. Breath Awareness:

- i. Inhale deeply as you lift your chest and tuck your head.
 - ii. Exhale as you relax your body and return to the starting position.
 - iii. Resume normal breathing once the movement is complete.
3. Contraindications : Individuals with cervical spondylitis or frozen shoulder should avoid practicing this asana.

119.

- Explain the procedure and benefits of any one asana for back pain.

Ans :

2024

Procedure of Tadasana for Back Pain :

1. Starting Position : Stand upright with your feet together, legs straight, and hands resting at your thighs. Keep your back aligned and look straight ahead.
2. Movement:
 - (i) Raise your arms upward, extending them over your head so they run parallel to one another, with palms facing inward.
 - (ii) Gradually lift your heels off the ground until you are balanced on your toes, stretching your body upward to its maximum extent. Hold this raised position for a few seconds.
3. Releasing Position:
 - (i) To return to the starting position, gently lower your heels back to the floor first.
 - (ii) Slowly lower your hands to your thighs and relax.
4. Benefits:
 - (i) Provides a vertical stretch to the muscles throughout your body.
 - (ii) Enhances overall posture and spinal alignment.
 - (iii) Reduces muscle tension and promotes relaxation.
 - (iv) Strengthens the muscles of the thighs, knees, and ankles.
 - (v) Helps alleviate feelings of laziness and lethargy, thereby calming the mind.

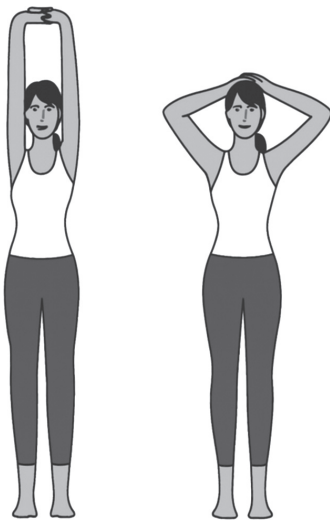
- 120.** Hypertension may be prevented by practising Tadasana and Shavasana. Describe the procedure of both the asanas.

Ans :

Term-II, 2021-22 C

Hypertension can be prevented by regularly practicing Tadasana and Shavasana. Here's the procedure for Tadasana:

1. Starting Position : Stand upright with your feet together, arms resting at your sides. Keep your back straight and gaze forward.
2. Procedure:
 - (i) Raise your arms upward over your head so they are parallel to each other, with palms facing inward.
 - (ii) Slowly lift your heels off the ground until you are balanced on your toes, stretching your body to its fullest. Hold this position for a few seconds.



3. Releasing Position:
 - (i) Gently lower your heels back to the floor first.
 - (ii) Gradually bring your hands down to your sides and relax.

121. Explain about the procedure and advantages of “Bhujangasana”.

Ans :

AI 2019

1. Procedure for Bhujangasana:
 - (i) Lie on your stomach with your forehead touching the floor. Position your hands alongside your thighs.
 - (ii) Move your hands forward to shoulder level and place your palms on the floor.
 - (iii) Slowly straighten your arms, lifting your head and trunk, with your head tilted slightly backward.
 - (iv) Hold the pose for 15–30 seconds before returning to the normal position.
 - (v) For optimal results, repeat the asana 3 to 5 times.
2. Advantages:
 - (i) It enhances blood circulation.

- (ii) It helps alleviate acidity, indigestion, and constipation.
- (iii) It improves the functioning of the liver, kidneys, pancreas, and gallbladder.
- (iv) It strengthens the arms and shoulders.
- (v) It aids in reducing obesity.

122. List down any three asanas used for preventing Asthma and write two benefits of each.

Ans :

Term-II, 2021-22

For treating asthma, the following asanas are recommended: Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottanasana, Matsyasana, and Kapalbhati.

1. Benefits of Bhujangasana:
 - (i) Enhances spinal flexibility and agility.
 - (ii) Aids in resolving various digestive issues.
2. Benefits of Matsyasana:
 - (i) Improves breathing functions.
 - (ii) Reduces anxiety and fosters a sense of well-being.
3. Benefits of Kapalbhati:
 - (i) Helps alleviate mental health issues such as depression, anxiety, and stress.
 - (ii) Boosts memory power and strengthens the immune system.

123. How does the combination of Tadasana, Katichakrasana, and other asanas help manage obesity, and what precautions should be observed?

Ans :

DELHI 2013

1. Procedure:
 - i. Tadasana: Establishes correct posture and body alignment, activating core muscles.
 - ii. Katichakrasana: Increases spinal mobility and gently massages abdominal organs, aiding digestion.
 - iii. Additional Asanas (Pawanmuktasana, Matsyasana): Target the digestive system to boost metabolism.
 - iv. Suryabedhan Pranayama: Enhances oxygen intake, stimulating metabolic activity.
2. Benefits : Improves digestion, reduces stress, and promotes overall energy flow.
3. Contraindications : Individuals with severe joint issues or back pain should practice under supervision to avoid strain.
4. Practical Tip : Begin gradually with proper guidance, ensuring each pose is adapted to personal fitness levels.

- 124.** How do specific yoga practices aid in diabetes management, and what are the key safety considerations?

Ans :

OD 2016

1. Procedure:
 - i. Katichakrasana & Pavanmuktasana : Stimulate the abdominal region to enhance insulin efficiency.
 - ii. Bhujangasana & Dhanurasana : Open the chest, improve circulation, and boost metabolic function.
 - iii. Kapalabhati : Uses rhythmic, forceful breathing to detoxify and energize the body.
 - iv. Shalabhasana, Supta Vajarasana, and Ardha-Matsyendrasana : Contribute to overall body balance and stimulate digestive organs.
2. Benefits : May help regulate blood sugar levels and reduce stress-induced fluctuations.
3. Contraindications : Those with low blood pressure or severe neuropathy should modify poses under professional guidance.
4. Practical Tip : Combine yoga with proper diet and regular medical check-ups for effective diabetes management.

- 125.** In what ways do the recommended asanas and pranayamas improve respiratory function in asthma patients?

Ans :

FOREIGN 2010

1. Procedure:
 - i. Tadasana: Establishes proper posture, allowing for more efficient breathing.
 - ii. Urdhwahastottansana & UttanMandukasana: Expand the chest and improve lung capacity.
 - iii. Bhujangasana & Dhanurasana: Open the thoracic region, facilitating easier breathing.
 - iv. Anuloma-Viloma: Controls and balances breathing, enhancing respiratory endurance.
 - v. Additional Asanas (Vakrasana, Gomukhasana, Matsyasana): Contribute to flexibility and relieve tension in the chest area.
2. Benefits : Helps reduce airway constriction and improves oxygen exchange.
3. Contraindications : Overexertion or incorrect posture may trigger an asthma attack; modifications are necessary.

4. Practical Tip : Practice under expert supervision to ensure safe, gradual improvement in respiratory function.

- 126.** How do specific yoga practices help control hypertension, and what precautions should one consider?

Ans :

FOREIGN 2012

1. Procedure:
 - i. Tadasana: Supports proper posture and reduces physical tension that could elevate blood pressure.
 - ii. Uttanpadasana: Strengthens leg muscles and improves overall circulation.
 - iii. Ardha Halasana & Gomukhasana: Encourage deep relaxation and balance in the body.
 - iv. Nadi-Shodhana Pranayama: Balances the nervous system, reducing stress and blood pressure spikes.
 - v. Additional Asanas (Sarala Matyasana, Makarasana): Promote calmness and better cardiovascular function.
2. Benefits : Regular practice may lower stress hormones and support heart health.
3. Contraindications : Strenuous poses should be modified for individuals with severe hypertension.
4. Practical Tip : Incorporate these practices gradually and under medical advice for safe blood pressure regulation.

- 127.** How do yoga asanas assist in relieving back pain and arthritis, and what should be kept in mind during practice?

Ans :

SQP 2005

1. Procedure:
 - i. Tadasana: Reinforces proper alignment, reducing undue stress on the spine.
 - ii. Urdhwahastottansana & Ardha Chakrasana: Gently mobilize the spine, alleviating stiffness and improving flexibility.
 - iii. Ushtrasana & Gomukhasana: Open the chest and shoulders, aiding overall posture improvement.
 - iv. Nadi-Shodhana Pranayama: Calms the nervous system and may reduce inflammation-related pain.
 - v. Additional Poses (Sarala Matsyendrasana, Bhujangasana): Enhance circulation and reduce joint tension.

2. Benefits : Strengthens core muscles, improves spinal mobility, and alleviates chronic pain.
3. Contraindications : Those with acute injuries or severe arthritis should modify poses and consult a specialist.
4. Practical Tip : Ensure gradual progression and consistent supervision to safely harness the benefits of yoga.

128. How does a daily yoga routine incorporating these asanas help in effective weight management?

Ans : COMP 2011

1. Procedure:
 - i. Daily Practice: Integrate Tadasana, Katichakrasana, and Pawanmuktasana into your routine to enhance core strength and digestion.
 - ii. Breathing Techniques: Include Suryabedha pranayama to boost oxygen flow and metabolic rate.
2. Benefits:
 - i. Improves overall body alignment, stimulates metabolism, and reduces stress-induced eating.
 - ii. Enhances digestive efficiency and supports fat breakdown.
3. Contraindications : Individuals with joint pain or back issues should modify poses to prevent injury.
4. Practical Tip : Begin with shorter sessions, gradually increasing duration under proper supervision for maximum benefits.

129. What is the role of yoga in balancing insulin levels and enhancing pancreatic function for diabetic individuals?

Ans : DELHI 2013

1. Procedure:
 - i. Targeted Asanas: Perform Katichakrasana and Pawanmuktasana to stimulate the abdominal region.
 - ii. Chest-Opening Poses: Practice Bhujangasana and Dhanurasana to improve blood flow.
 - iii. Breathing Exercise: Use Kapalabhati to energize and detoxify the body.
2. Benefits : Helps regulate blood sugar levels by enhancing pancreatic efficiency and reducing stress.
3. Contraindications : Modify exercises if experiencing low blood pressure or severe neuropathy.

4. Practical Tip : Combine with a balanced diet and regular check-ups to achieve holistic diabetes management.

130. How does yoga contribute to improved lung function and stress reduction in asthma management?

Ans : OD 2015

1. Procedure:
 - i. Posture Improvement: Tadasana and Bhujangasana help open the chest and promote deeper breathing.
 - ii. Breathing Regulation: Anuloma-Viloma aids in balancing oxygen and carbon dioxide exchange.
 - iii. Additional Poses: Incorporate Dhanurasana and Ushtrasana to further expand the thoracic cavity.
2. Benefits: Enhances respiratory capacity and reduces airway constriction while lowering stress levels.
3. Contraindications: Avoid overexertion and consult professionals to tailor practices during acute episodes.
4. Practical Tip : Practice gradually under expert guidance to safely build lung strength and endurance.

131. What specific yoga techniques help induce relaxation and control blood pressure in hypertensive individuals?

Ans : FOREIGN 2019

1. Procedure:
 - i. Calming Asanas: Utilize Tadasana and Uttanpadasana to establish a stable, relaxed posture.
 - ii. Relaxation Poses: Incorporate Ardha Halasana and Gomukhasana to reduce physical tension.
 - iii. Breathing Techniques: Employ Nadi-Shodhana pranayama to balance the nervous system.
2. Benefits: These practices lower stress hormones and promote cardiovascular health by easing blood pressure.
3. Contraindications: Modify or avoid strenuous exercises if severe hypertension is present.
4. Practical Tip : Combine these techniques with mindful relaxation methods for a comprehensive approach to blood pressure control.

- 132.** How does gentle yoga practice assist in alleviating chronic back pain and arthritis symptoms?

Ans :

SQP 2014

1. Procedure:
 - i. Foundation Building: Start with Tadasana to align the spine and reduce undue stress.
 - ii. Spinal Mobility: Engage in Urdhawahastottansana and Ardha Chakrasana to mobilize and relieve stiffness.
 - iii. Supportive Poses: Add Ushtrasana and Gomukhasana to open the chest and improve posture.
 - iv. Breathing Exercise: Use Nadi-Shodhana pranayama to soothe the nervous system and reduce inflammation.
2. Benefits : Enhances core strength, promotes flexibility, and reduces chronic pain.
3. Contraindications : Modify movements for severe arthritis or acute injuries to prevent further discomfort.
4. Practical Tip : Gradual progression with professional supervision ensures safe practice and long-term relief.

NODIA

1. Starting Position:
 - i. Lie face down on the mat with your forehead gently touching the floor.
 - ii. Stretch your arms alongside your body.
 - iii. Bend your elbows and position your palms beside your shoulders on the floor.
 - iv. Inhale slowly and lift your head, neck, and shoulders off the mat. Elevate your trunk until it reaches up to your navel, arching your back. Maintain this posture for 10–15 seconds.
2. Releasing Position:
 - i. Exhale slowly as you lower your torso, then bring your head and chin back down, so your forehead touches the ground.
 - ii. Straighten your arms and let them rest by your sides, relaxing completely.
3. Do's and Don'ts:
 - i. Do apply minimal weight on your hands.
 - ii. Ensure that only the part of your trunk up to the navel is raised.
 - iii. Do not lift the lower abdomen beyond the navel.
 - iv. Beginners should start with Nirālamba Bhujangasana (half cobra pose).
 - v. Avoid any jerky movements while performing the asana.

FIVE MARKS QUESTIONS

- 133.** List down any four asanas used for prevention of Hypertension. Explain the procedure and contraindication of any one of them with help of a stick diagram.

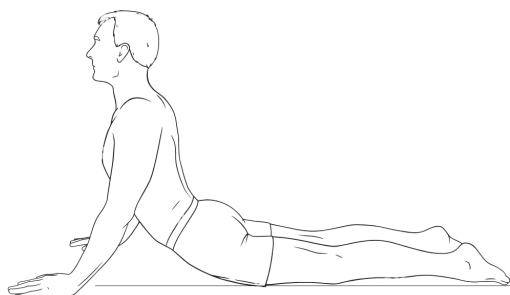
Ans :

2023

Four asanas used for prevention of Hypertension:

1. Child pose or Balasana
2. Sukhasana or easy pose
3. Shavasana
4. Bhujangasana (Cobra pose)
5. Bridge pose
6. Paschimottasana

Bhujangasana :



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- 134.** What is Obesity? Draw stick diagrams of any two asanas recommended to control obesity and explain their procedure.

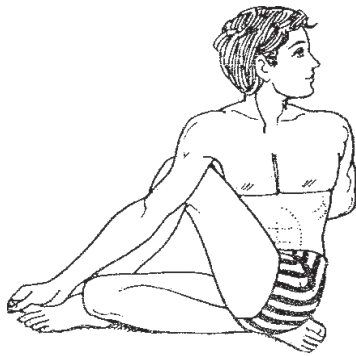
Ans :

Term-II, 2021-22

Obesity is the excess accumulation of fats which results in increased weight, reduce physical movements and slowness in emotional and mental activities. Stick diagrams and procedure of Ardha Matsyendrasana and Halasana.

Halasana :



Ardha Matsyendrasana :

NODIA

1. Procedure of Halasana :

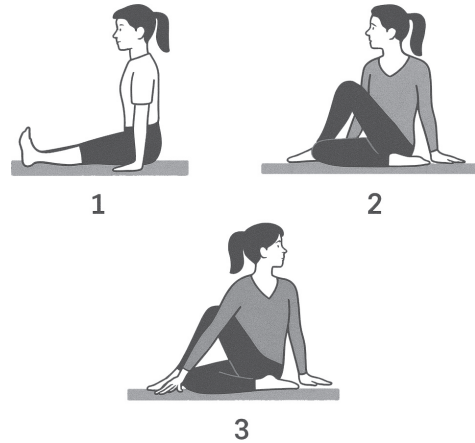
- i. **Starting Position:** Lie flat on your back on a yoga mat with your arms placed comfortably at your sides, palms facing down.
- ii. **Leg Lift:** Inhale and use your abdominal muscles to lift your feet off the floor, raising your legs vertically so they form a 90° angle with your body.
- iii. **Hip and Back Lift:** Continue to breathe normally. With support from your hands placed on your hips or lower back, lift your hips and entire back off the ground.
- iv. **Leg Sweep:** Slowly swing your legs over your head in a 180° arc until your toes reach toward (or gently touch) the floor behind you. Your back should become perpendicular to the floor. (If you find it difficult initially, attempt to hold for just a few seconds and gradually build up.)
- v. **Holding the Pose:** Maintain this position, allowing your body to relax deeper with each steady breath. Hold for up to one minute (or a few seconds for beginners).
- vi. **Releasing the Pose:** Exhale slowly as you carefully lower your legs back down to the floor, returning to your starting position.

2. Procedure of Ardha Matsyendrasana :

- i. **Starting Position:** Sit on the floor with your legs extended straight in front of you.
- ii. **Leg Positioning:** Bend your right leg and bring your right foot near your buttock so that the outer edge of the foot touches the floor. Bend your left leg at the knee and place the left foot flat on the floor on the outside of your right knee.
- iii. **Arm and Torso Twist:** Bring your right arm over your left knee and, with your right hand, grasp your left foot. Slowly

twist your torso to the left side. At the same time, bring your left arm behind you and wrap it around your waist to deepen the twist. Turn your head to the left, looking back over your shoulder.

- iv. **Holding the Pose:** Maintain the twisted position for 5–10 seconds, keeping your spine straight and breathing steadily.



- 135.** Which asanas are helpful in reducing obesity? Explain the procedure and contraindications of any one asana.

Ans :

Delhi 2019

Asanas are helpful in reducing obesity :

1. Tadasana
2. Halasana
3. Ardha Matsyendrasana
4. Ushtrasana

Ushtrasana (Camel Pose) is a kneeling backbend that derives its name from the Sanskrit “Ustra” (camel) and “Asana” (posture). This intermediate-level pose is known for opening the Anahata (heart chakra).

1. Procedure

- (i) Begin by kneeling on a yoga mat, placing your hands on your hips.
- (ii) Ensure that your knees align with your shoulders and that the soles of your feet face upward toward the ceiling.
- (iii) As you inhale, draw your tailbone toward your pubis as if it is being pulled from your navel.
- (iv) At the same time, arch your back and slide your palms down along your feet until your arms are fully extended.
- (v) Avoid straining or flexing your neck; keep it in a neutral position.
- (vi) Remain in this posture for a few breaths.

- (vii) Exhale as you slowly return to the starting position, withdrawing your hands and placing them back on your hips while straightening up.



2. Contraindications:

- Individuals who are elderly, have a hernia, or are less flexible should attempt this pose only with appropriate medical guidance.
- Those with spinal injuries should practice this asana under expert supervision.
- People with neck injuries, whiplash, or similar issues must avoid dropping their head back and should keep it neutral and close to their chest while practicing this posture.

136. Briefly explain the symptoms and causes of Asthma. Explain the procedure, benefits and contraindications of any two asanas to prevent Asthma.

Ans :

2021 C, 2018

Asthma is a condition affecting the respiratory system, specifically the airways in the lungs. Its symptoms include excessive mucus production, persistent coughing, heavy breathing, wheezing or whistling sounds, shortness of breath, airway swelling, chest tightness, and fatigue.

Causes of Asthma :

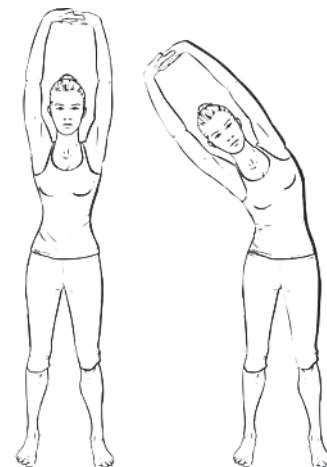
- Allergies
- Heredity
- Occupational factors – such as inhaling fumes, gases, dust, or other harmful substances in the workplace, including cigarette smoke, passive smoking, and polluted air
- Additionally, exposure to animals that trigger allergic reactions (such as pets) can also cause asthma.

Recommended Asanas : Gomukhasana, Bhujangasana, Paschimottanasana, Matsyasana, among others.

- Urdhva Hastottanasana : The name “Hastottanasana” is derived from the Sanskrit words “Hasta” (arms) and “Uttana” (stretched up), as this standing pose involves raising the arms upward and bending sideways. It is also referred to as the Up-Stretched Arms Yoga Asana.

Procedure:

- Begin by standing in Tadasana with your feet approximately 10 cm apart and your arms relaxed at your sides.
- Distribute your weight evenly on both feet, relaxing your arms, neck, and shoulders.
- Inhale and raise your arms above your head and shoulders.
- Bring your palms together overhead while keeping your feet firmly grounded.



- Engage your shin bones and kneecaps, and keep your thighs active as you stretch upward.
- Continue inhaling to deepen the stretch by engaging your core and stretching your neck muscles, gazing toward your raised hands.
- Hold this position for about 8–10 breaths, then exhale as you lower your arms back to your sides.

This completes one round of Urdhva Hastottanasana. Practice for about 10 rounds, then relax.

Benefits:

- Known as “yoga for a slim waist,” it helps reduce fat around the hips and buttocks.
- It stretches the chest, thereby increasing

lung capacity.

- iii. It aids in relieving constipation and can contribute to an increase in height.
- iv. It also provides support in alleviating back pain.

Contraindications:

- i. This pose should not be practiced by pregnant women.
 - ii. Individuals suffering from leg pain, insomnia, or dizziness should avoid this asana.
2. Uttan Mandukasana : The term “Uttana” means upright or stretched up, and “Manduka” means frog. The final posture of Uttana Mandukasana resembles an upright frog, which is why it is named so. This asana is one of the key poses in the International Day of Yoga common protocol.

Procedure:

- (i) Begin by sitting in Vajrasana (Thunderbolt Pose).
- (ii) Spread your knees wide apart while keeping your toes together.
- (iii) Raise your right arm, bend it, and bring it behind you so that the palm rests below your left shoulder.



NODIA

- (iv) Similarly, fold your left arm and position the palm below your right shoulder.
- (v) Hold the pose. When releasing, slowly remove your left arm first, then the right, and bring your knees back together to return to the initial position.

Benefits:

- (i) It provides a good stretch to the muscles and nerves in the throat region, helping to relieve throat pain.
- (ii) It increases the flexibility and suppleness of the back muscles, thereby alleviating back strain and pain.
- (iii) It is effective in relieving shoulder discomfort and addressing cervical issues.

- (iv) It assists in shedding excess fat from the sides of the abdominal area, contributing to a slimmer tummy.

Contraindications:

- (i) Those with arthritis, hernia, or back problems should avoid this pose.
- (ii) It is not recommended during pregnancy or menstruation.

137. Briefly explain the administration of Pavanmuktasana along with its contraindications and draw stick diagram.

Ans :

Term-II, 2021-22

1. Procedure:

- i. Lie on your back with your feet together and arms at your sides. Relax and breathe deeply.
- ii. On a deep inhalation, raise your legs to a 90° angle, then fully exhale.
- iii. Inhale again, drawing both knees toward your chest, pressing your lower abdomen and holding your knees with your hands. Exhale completely.
- iv. Keep your knees bent for a few breaths, pressing your thighs and knees onto your abdomen with each exhalation while holding them firmly.
- v. Take a deep breath and lift your head, neck, and chest, drawing them toward your knees. If possible, tuck your chin between your knees. Aim to minimize head movement while bringing your knees closer to your face, so that the pressure on the abdominal muscles helps release unwanted gas.
- vi. Remain in this position for several breaths, focusing on keeping your head and neck steady. With every exhalation, press your thighs more firmly against your chest and your face deeper into your knees.
- vii. Maintain balance while breathing slowly and keeping your body relaxed.
- viii. Then, on an inhalation, gently release your neck and head; exhale completely. On the next inhalation, straighten your legs back to 90°, and on exhalation, lower them gradually to a relaxed position until they are fully extended on the floor. Relax your neck as you complete the exhalation.
- ix. Take a few more breaths before beginning the next round. The longer you hold the

posture, the quicker the muscles around the abdomen will relax.

2. Contraindications : This pose should be avoided or performed under supervision by individuals with:
 - (i) Severe migraine
 - (ii) High or low blood pressure
 - (iii) Asthma
 - (iv) Slip disc
 - (v) Advanced stages of spondylitis
 - (vi) Girls/women should either avoid this asana or practice it only under proper guidance during their menstrual cycle.



- 138.** List down any four asanas used for prevention of asthma. Explain the procedure for administration of any one of them with the help of a stick diagram.

Ans :

2022-23

Four asanas used for prevention of asthma :

1. Tadasana
2. Urdhwahastottasana
3. Uttana Mandukasana
4. Bhujangasana

Uttana Mandukasana : The name “Uttana Mandukasana” is derived from two Sanskrit words: “Uttana” meaning upright or stretched up, and “Manduka” meaning frog. The final posture resembles an upright frog, which is why this asana is named as such. It is also a key pose in the International Day of Yoga common protocol.

1. Procedure:
 - i. Begin by sitting in Vajrasana (Thunderbolt Pose).
 - ii. Spread your knees widely while keeping your toes together.
 - iii. Raise your right arm, fold it, and bring it behind you so that your palm rests under your left shoulder



- iv. Next, fold your left arm in the same manner and place its palm under your right shoulder.
 - v. Hold this position, and when returning to the starting posture, slowly release your left arm first, then the right, and bring your knees back together as they were initially.
2. Do's and Don'ts:
 - i. Avoid this pose if you have any hip joint disabilities.
 - ii. Maintain normal, steady breathing while holding the pose.
 - iii. Ensure that when sitting, your knees are separated while your toes remain in contact with the floor, and your buttocks rest above your soles.
 3. Benefits:
 - i. It provides an excellent stretch to the muscles and nerves in the throat, which can help relieve throat pain.
 - ii. It enhances the flexibility and suppleness of the back muscles, thereby alleviating back strain and discomfort.
 - iii. The pose is effective in relieving shoulder pain and cervical issues.
 - iv. It assists in reducing excess fat on the sides of the abdomen, promoting a slimmer waistline, especially around the tummy.
 4. Contraindications:
 - i. Those with arthritis, hernia, or back problems should avoid this pose.
 - ii. It is not recommended for practice during pregnancy or menstruation.

- 139.** For the management of obesity, discuss the procedure, benefits, and contraindications of the following practices: Tadasana, Katichakrasana, Pawanmuktasana, Matsyasana, Halasana, Pachimottanasana, Ardha-Matsyendrasana, Dhanurasana, Ushtrasana, and Suryabedhan

Pranayama.

Ans :

COMP 2016

When addressing obesity, a combination of postures and breathing techniques can enhance metabolism, stimulate digestion, and promote fat loss. Key points include:

1. Procedure:
 - i. Tadasana (Mountain Pose): The practitioner stands upright with feet together, engages the core, and stretches upward while maintaining a neutral spine.
 - ii. Katichakrasana (Waist Rotations): Involves gentle trunk twisting, with attention to a steady, controlled rotation that mobilizes the abdominal area.
 - iii. Pavanmuktasana (Wind-Relieving Pose): Performed by lying supine and drawing the knees to the chest to massage the abdominal organs.
 - iv. Matsyasana (Fish Pose) & Halasana (Plow Pose): These poses stretch the abdominal muscles and improve circulation; they require slow transitions to avoid strain.
 - v. Paschimottanasana (Seated Forward Bend): Encourages deep forward bending to stimulate the digestive system.
 - vi. Ardha-Matsyendrasana (Half Spinal Twist): Involves a seated twist that increases spinal mobility and massages internal organs.
 - vii. Dhanurasana (Bow Pose) & Ushtrasana (Camel Pose): Open up the chest and abdomen to boost metabolism and energy flow.
 - viii. Suryabedhan Pranayama: A sun salutatory breathing practice that energizes the body.
2. Benefits:
 - i. Increases metabolic rate and aids in calorie burning.
 - ii. Stimulates the digestive system and improves elimination of toxins.
 - iii. Enhances muscle tone and posture while reducing abdominal fat.
3. Contraindications:
 - i. Individuals with severe spinal problems, uncontrolled hypertension, or cardiovascular issues should exercise caution.
 - ii. Poses that involve deep backbends (like Halasana or Ushtrasana) should be avoided by those with acute back pain or

herniated discs.

- iii. By practicing these asanas with proper guidance, one can support weight management while avoiding undue stress on vulnerable body parts.

- 140.** For diabetes management, explain the procedure, benefits, and contraindications for the following asanas and practices: Katichakrasana, Pavanmuktasana, Bhujangasana, Shalabhasana, Dhanurasana, Supta-Vajrasana, Paschimottanasana, Ardha-Matsyendrasana, Mandukasana, Gomukasana, Yogmudra, Ushtrasana, and Kapalabhati.

Ans :

DELHI 2018

In managing diabetes, yoga plays a supportive role in regulating blood sugar levels, improving circulation, and reducing stress. Key details include:

1. Procedure:
 - i. Katichakrasana (Waist Rotations) & Pavanmuktasana (Wind-Relieving Pose): Performed as described earlier, these poses aid in abdominal stimulation.
 - ii. Bhujangasana (Cobra Pose): Involves lying prone and gently lifting the chest using the strength of the back, which stimulates the pancreas.
 - iii. Shalabhasana (Locust Pose): Focuses on lifting the chest and legs simultaneously to strengthen the back muscles.
 - iv. Dhanurasana (Bow Pose): Requires bending backward while holding the ankles, thus stretching and toning the entire abdominal region.
 - v. Supta-Vajrasana (Reclining Thunderbolt Pose): A seated posture that relaxes the abdomen and stimulates digestive functions.
 - vi. Paschimottanasana (Seated Forward Bend) & Ardha-Matsyendrasana (Half Spinal Twist): Enhance blood flow to the abdominal organs.
 - vii. Mandukasana (Frog Pose) & Gomukasana (Cow Face Pose): Improve flexibility in the hips and shoulders, indirectly reducing stress levels.
 - viii. Yogmudra: A hand gesture practiced during meditation to promote mental calmness.
 - ix. Ushtrasana (Camel Pose): Opens up the chest and abdominal area to support energy flow.

- (ii) Equipment Adjustments: Utilize adaptive equipment to ensure everyone can play on an even field.
- 3. Sensitization and Training : Conduct workshops and training sessions for educators, coaches, and peers to foster an empathetic and supportive environment.
- 4. Community Engagement : Involve parents, local organizations, and disability advocates to create a network that supports inclusive sports at every level.

4. ADVANTAGES OF PHYSICAL ACTIVITIES FOR CHILDREN WITH SPECIAL NEEDS

4.1 Physical Benefits

- 1. Enhanced Fitness and Strength : Regular physical activity improves cardiovascular health, muscle tone, balance, and flexibility, all of which are crucial for daily functioning and overall well-being.
- 2. Development of Motor Skills : Engaging in structured sports helps in refining motor coordination, which is vital for enhancing independence and performing everyday tasks effectively.
- 3. Increased Endurance : Sustained physical activities build stamina, enabling children to participate in longer sessions and improve their physical resilience over time.

4.2 Psychological Benefits

- 1. Boost in Self-Esteem : Success in sports, regardless of scale, can dramatically elevate a child's confidence. Achieving personal milestones, no matter how small, reinforces a positive self-image.
- 2. Reduction in Stress and Anxiety : Physical activities act as natural stress relievers, allowing children to release pent-up energy and reduce anxiety through structured play and exercise.
- 3. Emotional Regulation : Sports provide a safe space for children to express their emotions, learn coping mechanisms, and develop a balanced emotional outlook.

4.3 Social Benefits

- 1. Enhanced Communication Skills: Participation in team sports nurtures essential social skills, including verbal and non-verbal communication, which are critical for personal development.

- 2. Teamwork and Cooperation : Being part of a team teaches children about cooperation, sharing, and the importance of working together to achieve common goals.
- 3. Community Building : Sports clubs and events create a sense of community, helping children to forge friendships and build support networks that extend beyond the playing field.

4.4 Overall Impact on Development

- 1. Holistic Growth : Physical activities contribute significantly to the all-round development of children, positively impacting their physical health, mental well-being, and social interactions.
- 2. Long-Term Health Benefits : Regular engagement in sports can establish lifelong habits that reduce the risk of chronic diseases and promote overall wellness.
- 3. Personal Empowerment : The cumulative benefits of physical activity empower children with special needs to lead more active, independent, and fulfilling lives.

5. STRATEGIES TO MAKE PHYSICAL ACTIVITIES ACCESSIBLE FOR CHILDREN WITH SPECIAL NEEDS

- 1. Adaptation of Activities
 - (i) Modifying Traditional Games : Adapt sports by altering rules, game formats, and playing environments to accommodate children with diverse needs. For example, a game of basketball might involve lowering the hoop or allowing more time for passes.
 - (ii) Flexible Participation Models : Create opportunities for children to participate at varying levels, allowing them to engage as per their individual capabilities. This may include tiered participation options or rotating roles within a team.
- 2. Use of Adaptive Equipment
 - (i) Specialized Tools : Invest in adaptive equipment such as lighter or larger balls, assistive devices like ramps and specialized wheelchairs, and modified bicycles that cater specifically to the needs of children with disabilities.
 - (ii) Regular Maintenance and Training : Ensure that all equipment is regularly checked and maintained for safety and functionality. Provide training sessions so

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CASE BASED QUESTION

- ii. Urdhwahastottanasana (Raised Arms Stretch): A gentle upward stretch that opens the chest and relieves upper back stiffness.
 - iii. Ardha Chakrasana (Half Wheel Pose): Performed with caution to create a mild backbend that mobilizes the spine.
 - iv. Ushtrasana (Camel Pose) & Vakrasana (Twisted Pose): Involve moderate back extensions and gentle twists to reduce muscle tension.
 - v. Sarala Matsyendrasana (Simple Spinal Twist): Offers a controlled twist that massages the spine without overstraining.
 - vi. Bhujangasana (Cobra Pose): A gentle backbend that strengthens the back muscles and improves posture.
 - vii. Gomukhasana (Cow Face Pose) & Bhadrasana (Gracious Pose): Enhance flexibility and help maintain joint mobility.
 - viii. Makarasana (Crocodile Pose): Encourages deep relaxation and gentle stretching of the back.
 - ix. Nadi-Shodhana Pranayama (Alternate Nostril Breathing): Calms the mind and promotes balanced breathing, which can help reduce pain perception.
2. Benefits:
 - i. Improves spinal flexibility and strengthens supporting musculature.
 - ii. Enhances circulation to the affected areas, reducing inflammation and pain.
 - iii. Promotes overall relaxation, which is essential for managing chronic pain and arthritis symptoms.
 3. Contraindications:
 - i. Individuals with acute pain episodes or severe structural spinal issues should avoid deep backbends or intense twists.
 - ii. Modifications are necessary for those with advanced arthritis to prevent overstressing joints.
 - iii. All postures should be performed under expert supervision to ensure movements are within a safe range of motion.
 - iv. With careful practice and appropriate modifications, these yoga practices can contribute significantly to relieving back pain and managing arthritis symptoms while enhancing overall functional mobility.

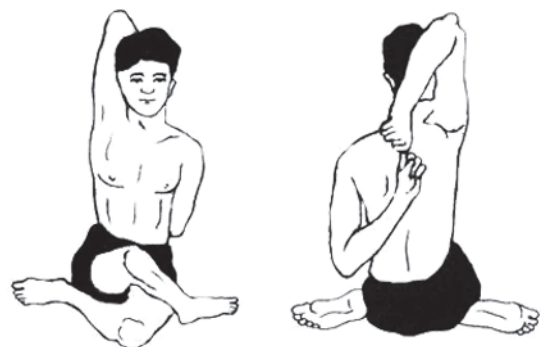
143. Your uncle is manager in a reputed company. He works on computer regularly for long hours. Though he is conscious about his diet, he is suffering from blurred vision. Since long, he is taking medical treatment for his wound on left elbow. But it is not healing. Based on the above context, answer the following questions:

- (a) Name the disease, your uncle is suffering from.
- (b) Suggest two asanas to cure the disease.
- (c) Which measures will you adopt to stay healthy?

Ans :

- (a) Diabetes
- (b) Bhujangasana, Paschimottanasana, Pawanmuktasana. Ardha Matsyendrasana to be done in consultation with a doctor.
- (c) (i) Balanced diet
(ii) Exercise regularly/physical activity
(iii) Complete sleep/proper rest
(iv) Intake of plenty of water
(v) Avoid overeating/junk food/fatty food.

144. In reference to the picture answer the following questions :



- (i) The yoga posture shown in the image is:
 - (a) Padmasana
 - (b) Gomukhasana
 - (c) Vajrasana
 - (d) Tadasana

Ans :

- (b) Gomukhasana
- (ii) Which parts of the body are primarily stretched in Gomukhasana?

(i) The yoga posture shown in the image is:

- (a) Vajrasana
- (b) Vakrasana
- (c) Tadasana
- (d) Bhujangasana

Ans :

(b) Vakrasana

(ii) Which part of the body is primarily stretched or twisted in Vakrasana?

- (a) Lower legs
- (b) Arms and shoulders
- (c) Spine and oblique muscles
- (d) Neck only

Ans :

(c) Spine and oblique muscles

(iii) Which of the following is a commonly cited benefit of Vakrasana?

- (a) Improves digestion and massages abdominal organs
- (b) Strengthens the calf muscles
- (c) Focuses mainly on balancing skills
- (d) Isolates neck movements

Ans :

(a) Improves digestion and massages abdominal organs

(iv) Which best describes the general alignment in Vakrasana?

- (a) Lying flat on the back with legs elevated
- (b) Standing on one leg while arching the spine
- (c) Seated with the torso twisting toward one side
- (d) Kneeling and bending forward

Ans :

(c) Seated with the torso twisting toward one side

149. In reference to the picture answer the following questions :



(i) The yoga posture shown in the image is:

- (a) Vajrasana
- (b) Balasana
- (c) Mandukasana
- (d) Bhujangasana

Ans :

(c) Mandukasana

(ii) Another common name for Mandukasana is:

- (a) Cat Pose
- (b) Frog Pose
- (c) Camel Pose
- (d) Child's Pose

Ans :

(b) Frog Pose

(iii) Which of the following is a commonly cited benefit of Mandukasana?

- (a) Strengthens the shoulders
- (b) Improves digestion by massaging abdominal organs
- (c) Primarily enhances ankle flexibility
- (d) Focuses on balancing on one foot

Ans :

(b) Improves digestion by massaging abdominal organs

(iv) Which best describes the general alignment in Mandukasana?

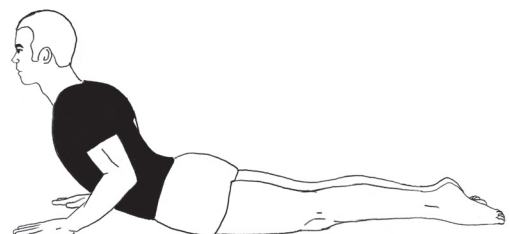
- (a) Standing upright with arms extended overhead
- (b) Lying on the back with knees bent
- (c) Kneeling with buttocks on the heels, leaning forward
- (d) Sitting cross-legged with a twisted spine

Ans :

(c) Kneeling with buttocks on the heels, leaning forward

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150. In reference to the picture answer the following questions :



Ans :

- (b) Anulom Vilom
- (ii) In Anulom Vilom Pranayama, you typically:
- Exhale forcefully through the nose each time
 - Breathe in and out only through the left nostril
 - Alternate breathing through the left and right nostrils
 - Retain the breath for several minutes

Ans :

- (c) Alternate breathing through the left and right nostrils
- (iii) The hand gesture traditionally used to alternate nostrils is called:
- Chin Mudra
 - Vishnu Mudra
 - Jnana Mudra
 - Surya Mudra

Ans :

- (b) Vishnu Mudra
- (iv) Which of the following is a commonly cited benefit of Anulom Vilom?
- Strengthening the biceps
 - Improving digestive health exclusively
 - Promoting mental calmness and balanced breathing
 - Increasing ankle mobility

Ans :

- (c) Promoting mental calmness and balanced breathing

147. In reference to the picture answer the following questions :



- (i) The yoga posture shown in the image is:
- Halasana
 - Ardha-Halasana
 - Viparita Karani
 - Sarvangasana

Ans :

- (b) Ardha-Halasana
- (ii) Which of the following is a characteristic feature of Ardha-Halasana?
- Twisting the torso
 - Lifting both legs to a 90° angle while lying on the back
 - Rolling onto the shoulders
 - Standing on one leg

Ans :

- (b) Lifting both legs to a 90° angle while lying on the back
- (iii) Which part of the body is primarily engaged in Ardha-Halasana?
- Arms and shoulders
 - Neck muscles
 - Core and lower back
 - Calves and ankles

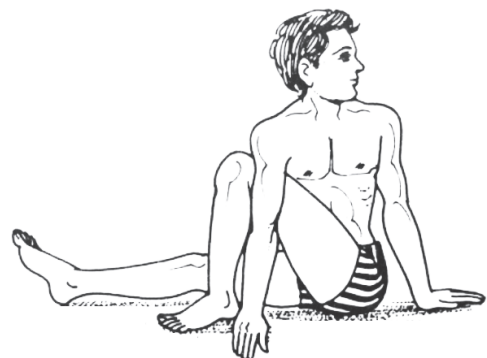
Ans :

- (c) Core and lower back
- (iv) Which of the following is a commonly cited benefit of practicing Ardha-Halasana?
- Increases shoulder flexibility
 - Improves balance in the standing position
 - Strengthens abdominal muscles and aids digestion
 - Relaxes the jaw and facial muscles

Ans :

- (c) Strengthens abdominal muscles and aids digestion

148. In reference to the picture answer the following questions :



- (a) Calves and ankles
- (b) Shoulders and hips
- (c) Neck and chest
- (d) Lower back and glutes

Ans :

- (b) Shoulders and hips

(iii) Another common name for Gomukhasana is:

- (a) Cow Face Pose
- (b) Downward Dog Pose
- (c) Cobra Pose
- (d) Bow Pose

Ans :

- (a) Cow Face Pose

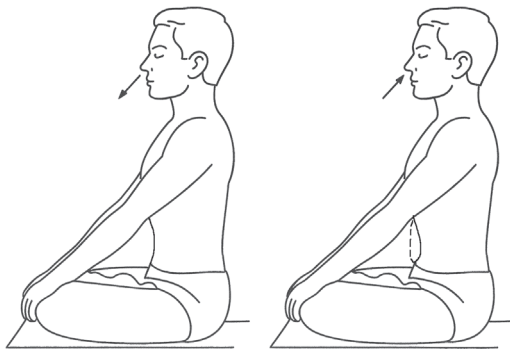
(iv) Which of the following is a common benefit of practicing Gomukhasana?

- (a) Strengthens abdominal muscles
- (b) Improves flexibility in the upper body and hips
- (c) Stimulates the thyroid gland
- (d) Enhances cardiovascular endurance

Ans :

- (b) Improves flexibility in the upper body and hips

145. In reference to the picture answer the following questions :



(i) The yoga breathing technique shown in the image is:

- (a) Anulom Vilom
- (b) Kapalbhathi
- (c) Bhramari
- (d) Ujjayi

Ans :

- (b) Kapalbhathi

(ii) Which statement best describes the core action in Kapalbhathi?

- (a) Slow, controlled inhalation and exhalation
- (b) Rapid, forceful exhalation and passive inhalation
- (c) Breathing only through the left nostril
- (d) Retaining the breath for as long as possible

Ans :

- (b) Rapid, forceful exhalation and passive inhalation

(iii) Which part of the body is most actively engaged during Kapalbhathi?

- (a) Neck muscles
- (b) Diaphragm and abdominal muscles
- (c) Calf muscles
- (d) Shoulder muscles

Ans :

- (b) Diaphragm and abdominal muscles

(iv) Which of the following is a commonly cited benefit of Kapalbhathi Pranayama?

- (a) Increases flexibility of the hamstrings
- (b) Strengthens abdominal region and improves circulation
- (c) Enhances ankle stability
- (d) Reduces shoulder tension only

Ans :

- (b) Strengthens abdominal region and improves circulation

146. In reference to the picture answer the following questions :



(i) The yoga breathing technique shown in the image is:

- (a) Bhramari
- (b) Anulom Vilom
- (c) Kapalbhathi
- (d) Surya Bhedana

(i) The yoga posture shown in the image is:

- (a) Vajrasana
- (b) Tadasana
- (c) Bhujangasana
- (d) Balasana

Ans :

(c) Bhujangasana

(ii) Another common name for Bhujangasana is:

- (a) Cobra Pose
- (b) Cat Pose
- (c) Child's Pose
- (d) Frog Pose

Ans :

(a) Cobra Pose

(iii) Which part of the body is primarily targeted in Bhujangasana?

- (a) Calves
- (b) Lower back and spine
- (c) Neck and shoulders only
- (d) Forearms

Ans :

(b) Lower back and spine

(iv) Which of the following is a commonly cited benefit of Bhujangasana?

- (a) Strengthens ankle joints
- (b) Stretches the chest, shoulders, and abdominal region
- (c) Improves balance on one foot
- (d) Focuses on hamstring flexibility

Ans :

(b) Stretches the chest, shoulders, and abdominal region

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- x. **Kapalabhati (Skull Shining Breath):**
A cleansing pranayama that improves oxygenation and stimulates digestive fire.
- 2. **Benefits:**
 - i. Helps regulate blood glucose levels and improve insulin sensitivity.
 - ii. Enhances overall digestion and stimulates the endocrine system.
 - iii. Reduces stress and improves mental focus, which is beneficial for long-term diabetes management.
- 3. **Contraindications:**
 - i. Caution is advised for individuals with low blood pressure, severe back problems, or recent abdominal surgery.
 - ii. Intensive breathing practices like Kapalabhati should be avoided by those with respiratory issues or high blood pressure.
 - iii. Properly executed, these practices can be a valuable adjunct to conventional diabetes management, provided they are performed under professional supervision.

141. Explain the procedure, benefits, and contraindications for the following yoga practices recommended for hypertension: Tadasana, Katichakrasana, Uttanpadasana, Ardha Halasana, Sarala Matsyasana, Gomukhasana, Uttan Mandukasana, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-Shodhan Pranayama, and Sitli Pranayama.

Ans :

COMP 2020

For individuals with hypertension, yoga practices are tailored to reduce stress and lower blood pressure through gentle movements and regulated breathing. Key points include:

- 1. **Procedure:**
 - i. **Tadasana (Mountain Pose):** A simple, stabilizing posture that promotes proper alignment and calm breathing.
 - ii. **Katichakrasana (Waist Rotations):** Performed slowly to stimulate abdominal organs without overstraining.
 - iii. **Uttanpadasana (Raised-Leg Pose):** Involves gentle elevation of the legs to improve circulation.
 - iv. **Ardha Halasana (Half Plow Pose) & Sarala Matsyasana (Simple Fish Pose):** These mild inversions help to improve blood flow but must be done with care.
 - v. **Gomukhasana (Cow Face Pose) & Uttan Mandukasana (Modified Frog Pose):**

- Focus on chest opening and deep, relaxed breathing.
- vi. **Vakrasana (Twisted Pose) & Bhujangasana (Cobra Pose):** Involve controlled twisting and gentle backbends to relieve tension.
- vii. **Makarasana (Crocodile Pose) & Shavasana (Corpse Pose):** Used for deep relaxation.
- viii. **Nadi-Shodhan and Sitli Pranayama:** These breathing practices help balance the autonomic nervous system and induce a calming effect.

- 2. **Benefits:**
 - i. Lowers stress levels and thereby reduces blood pressure.
 - ii. Improves circulation and heart function by encouraging a state of relaxation.
 - iii. Enhances overall mental clarity and emotional balance.
- 3. **Contraindications:**
 - i. Deep inversions or rapid twists should be avoided by individuals with uncontrolled hypertension.
 - ii. Poses that involve significant straining (such as aggressive backbends) might elevate blood pressure and should be modified.
 - iii. Intensive breathing techniques should be practiced under supervision to prevent hyperventilation.
 - iv. When performed mindfully and with proper modifications, these yoga practices can significantly contribute to the management of high blood pressure.

142. For individuals suffering from back pain and arthritis, describe the procedure, benefits, and contraindications for the following practices: Tadasana, Urdhwahastottanasana, Ardha Chakrasana, Ushtrasana, Vakrasana, Sarala Matsyendrasana, Bhujangasana, Gomukhasana, Bhadrasana, Makarasana, and Nadi-Shodhana Pranayama.

Ans :

OD 2017

Yoga for back pain and arthritis focuses on gentle mobilization, muscle strengthening, and deep relaxation to relieve discomfort and enhance joint flexibility. Key aspects include:

- 1. **Procedure:**
 - i. **Tadasana (Mountain Pose):** Establishes proper alignment and engages core muscles without strain.

3. Impact: Deaflympics plays a vital role in promoting inclusivity by creating environments where deaf athletes can thrive, thereby contributing to broader societal acceptance and integration of individuals with hearing impairments.

2. CONCEPT OF CLASSIFICATION AND DIVISIONING IN SPORTS

2.1 Classification

1. Definition : Classification is a systematic method used to categorize athletes based on the type and extent of their impairments. This process considers factors such as physical strength, motor skills, and sensory limitations.
2. Purpose : The primary goal is to ensure that athletes compete on an equal footing, where performance is determined by skill and training rather than the severity of disability.
3. Examples in Practice
 - (i) In wheelchair basketball, players are classified according to their physical capabilities to balance team composition.
 - (ii) In track and field events, classification might involve grouping athletes based on mobility and muscle strength.

2.2 Divisioning

1. Definition : Divisioning takes classification a step further by organizing athletes into different competitive categories or divisions. This helps in creating a structured framework for tournaments and competitions.
2. Benefits
 - (i) Enhanced Fairness: Matches athletes with peers of similar functional ability, reducing performance disparities.
 - (ii) Focused Competition: Encourages healthy rivalry and drives athletes to push their limits within their division.
3. Impact on Competitions : This structured approach not only upholds the integrity of sports competitions but also boosts the confidence of participants, knowing that they are competing under fair and balanced conditions.
4. Overall Importance
 - (i) Equitable Opportunities : Both classification and divisioning ensure that every athlete is given a fair chance to succeed, regardless of the nature or

severity of their disability.

- (ii) Promotion of Integrity : These practices instill a sense of fairness and transparency in sports, thereby enhancing the credibility and popularity of disability sports globally.

3. CONCEPT OF INCLUSION IN SPORTS

3.1 Definition and Core Principles

1. Definition : Inclusion means ensuring that every child, irrespective of their physical, intellectual, or sensory abilities, is provided with the opportunity to participate in sports. It is about creating an environment where every individual feels respected, supported, and empowered.
2. Core Beliefs
 - (i) Equality : Every child has the right to participate and succeed in sports.
 - (ii) Respect for Diversity : Embracing differences as strengths and fostering mutual respect among participants.
 - (iii) Long-Term Vision : Inclusive sports aim to create a society where differences are not only accepted but celebrated, thereby contributing to overall social cohesion and unity.

3.2 Need for Inclusion

1. Social Integration : Inclusion helps bridge the gap between children with special needs and their peers, fostering a sense of belonging and reducing social isolation.
2. Psychological Empowerment : Participation in inclusive sports can boost self-confidence, enhance self-worth, and provide a positive outlet for expression and personal growth.
3. Educational Benefits : Inclusive sports programs often lead to improved communication skills, better problem-solving abilities, and increased academic engagement as children learn to work together.

3.3 Implementation Strategies

1. Policy Reforms : Schools and sports bodies must adopt inclusive policies that mandate equal participation opportunities for all students.
2. Adaptive Approaches
 - (i) Rules and Regulations: Modify existing rules to suit the abilities of all participants.

CHAPTER 4

PHYSICAL EDUCATION AND SPORTS FOR CWSN (CHILDREN WITH SPECIAL NEEDS DIVYANG)

SUMMARY

1. ORGANIZATIONS PROMOTING DISABILITY SPORTS

Renowned organizations such as Special Olympics, Paralympics, and Deaflympics play a transformative role in redefining sports for children with special needs. These institutions not only organize competitive events but also create a supportive ecosystem that promotes social integration, personal growth, and awareness about disabilities.

1.1 Special Olympics

1. Focus and Mission: Special Olympics is committed to empowering individuals with intellectual disabilities by offering opportunities to participate in a wide range of sports. Its mission is to foster self-esteem and social skills while encouraging community acceptance.
2. Key Programs and Activities
 - (i) Training Programs: Regular sessions aimed at improving physical fitness and sportsmanship.
 - (ii) Community Events: Local, national, and international competitions that provide athletes with the chance to showcase their talents.
 - (iii) Social Initiatives: Activities that extend beyond sports, such as workshops and community service projects, to build confidence and life skills.
3. Impact : The organization has a significant social impact by breaking down stereotypes, raising public awareness, and inspiring individuals with special needs to pursue athletic and personal achievements.

1.2 Paralympics

1. Focus and Mission: Paralympics is dedicated to athletes with physical disabilities, promoting high-level competitive sports and demonstrating that physical limitations can be overcome with dedication and training.
2. Key Features
 - (i) Elite Competitions: Events that run parallel to the Olympic Games, showcasing world-class athletic performances.
 - (ii) Rigorous Classification: Detailed systems are in place to group athletes by their functional abilities, ensuring fair competition.
 - (iii) Global Reach: Paralympics has a broad international influence, enhancing the visibility of athletes with disabilities across the globe.
3. Impact : By highlighting athletic prowess and resilience, Paralympics not only challenges societal perceptions but also paves the way for better accessibility in sports infrastructure and community programs.

1.3 Deaflympics

1. Focus and Mission: Deaflympics is specifically designed for athletes with hearing impairments. The organization is committed to ensuring that communication barriers do not hinder participation or performance in sports.
2. Key Programs and Adaptations
 - (i) Adapted Communication: Use of visual signals and sign language interpreters during competitions and training sessions.
 - (ii) Inclusive Sports Events: International competitions that provide a platform for deaf athletes to compete at high levels.
 - (iii) Cultural Exchange: Promotes understanding and respect for deaf culture through various educational initiatives and public events.

that children, teachers, and coaches can effectively utilize this equipment.

3. Teacher and Coach Training :

- (i) Specialized Programs : Develop and implement training programs that equip teachers and coaches with the skills to design inclusive sports activities. These programs should cover adaptive techniques, classroom management strategies, and the psychological aspects of working with children with special needs.
- (ii) Continuous Professional Development: Encourage ongoing training and workshops to keep educators updated on the latest practices in inclusive sports education, ensuring they remain responsive to the evolving needs of their students.

4. Accessible Environment and Facilities

- (i) Physical Infrastructure Modifications: Ensure that sports facilities are designed or modified to be fully accessible. This includes installing ramps, widened doorways, tactile pathways, accessible restrooms, and appropriate lighting.
- (ii) Safety and Comfort Enhancements: Adapt the environment to be safe for all users by removing obstacles, using non-slip surfaces, and ensuring that emergency exits are clearly marked and easily accessible.
- (iii) Designing Inclusive Play Areas : Develop specialized play zones that cater to the physical and sensory needs of children with disabilities, allowing them to explore and play without limitations.

5. Collaborative and Community Efforts

- (i) Engaging Stakeholders: Form partnerships with parents, local disability advocacy groups, community organizations, and experts to develop comprehensive, inclusive sports programs.
- (ii) Resource Sharing and Best Practices: Create platforms for exchanging ideas, resources, and success stories that highlight effective strategies for making sports accessible. This could include regional workshops, online forums, and collaborative events.
- (iii) Feedback and Continuous Improvement: Establish mechanisms to gather feedback from participants and stakeholders,

allowing for continuous refinement of programs to better meet the needs of children with special needs.

MULTIPLE CHOICE QUESTION

1. First Deaflympic Games was organised in the year
 - (a) 1896
 - (b) 1960
 - (c) 1924
 - (d) 1951

Ans :

2023

- (c) 1924

The first Deaflympic Games were held in 1924 in Paris. This event marked the beginning of an international sporting competition specifically for deaf athletes, establishing a platform for sporting excellence and inclusion among the deaf community.

2. Cognitive disability may cause difficulty in which of the following activity ?
 - (a) Reading
 - (b) Writing
 - (c) Mathematics
 - (d) All of the above

Ans :

SQP2020

- (d) All of the above

Cognitive disabilities often impact several learning areas, making reading, writing, and mathematics challenging. These difficulties arise from processing and memory issues, affecting the acquisition and use of these essential academic skills simultaneously.

3. International Paralympic Committee was formed in _____.
 - (a) 1985
 - (b) 2003
 - (c) 1989
 - (d) 2001

Ans :

2024

- (c) 1989

The International Paralympic Committee was established in 1989. This formation provided a unified organization to promote and organize Paralympic sports, ensuring that athletes with disabilities receive structured support and global representation in competitive sports.

Ans :

COMP 2004

(b) Inclusive sports policies

Inclusive sports policies at the national level are essential for supporting disability sports. They provide guidelines, allocate resources, and establish standards that promote equal opportunities, accessibility, and structured development for athletes with special needs in various sports disciplines, with worldwide recognition.

54. Which factor is crucial for ensuring funding for inclusive sports programs for CWSN?

- (a) Private donations
- (b) Government support
- (c) Commercial sponsorships
- (d) All of the above

Ans :

DELHI 2007

(d) All of the above

Ensuring funding for inclusive sports programs for children with special needs requires a multifaceted approach. Private donations, government support, and commercial sponsorships all contribute significantly to financial stability, enabling the development, sustainability, and expansion of accessible sports initiatives across communities.

55. Which benefit is associated with mixed-ability sports programs?

- (a) Segregation
- (b) Enhanced social integration
- (c) Increased isolation
- (d) Lower performance

Ans :

OD 2003

(b) Enhanced social integration

Mixed-ability sports programs offer the benefit of enhanced social integration by bringing together athletes of varying abilities. This inclusive approach fosters mutual understanding, reduces social stigma, and creates opportunities for cooperative play, thereby strengthening community bonds and improving participation.

56. Which role does government play in supporting disability sports programs?

- (a) Providing policy frameworks
- (b) Ignoring inclusive sports
- (c) Reducing funding
- (d) Discouraging participation

Ans :

FOREIGN 2008

(a) Providing policy frameworks

Government support for disability sports programs involves providing robust policy frameworks,

financial resources, and infrastructural improvements. These efforts create an enabling environment for inclusive sports, ensuring that children with special needs have access to quality training, competitions, and long-term athletic development.

57. Which long-term outcome is associated with inclusive physical education for children with special needs?

- (a) Improved academic performance
- (b) Increased social isolation
- (c) Reduced physical activity
- (d) Heightened stress

Ans :

SQP 2006

(a) Improved academic performance

Long-term inclusive physical education for children with special needs results in improved academic performance. Enhanced physical fitness, increased self-confidence, and improved social interactions contribute to better concentration, reduced behavioral issues, and overall positive effects on learning and academic achievement over time.

58. Which aspect of physical education is crucial for ensuring overall well-being of CWSN?

- (a) Regular exercise
- (b) Sedentary behavior
- (c) Lack of physical activity
- (d) Unstructured play

Ans :

COMP 2002

(a) Regular exercise

Regular exercise is crucial for ensuring the overall well-being of children with special needs. It enhances physical health, improves mental well-being, and supports social interaction. Consistent activity leads to better motor skills, increased endurance, and higher self-esteem among participants, consistently.

59. Which long-term benefit arises from promoting inclusion in sports for children with special needs?

- (a) Improved community cohesion
- (b) Increased segregation
- (c) Reduced self-worth
- (d) Lower fitness levels

Ans :

DELHI 2010

(a) Improved community cohesion

Promoting inclusion in sports leads to improved community cohesion. It brings together individuals from diverse backgrounds, fosters mutual respect,

10. The founder of Special Olympics was

- (a) Eunice Kennedy Shriver
- (b) John F. Kennedy
- (c) Lyndon B. Johnson
- (d) Donald Trump

Ans :

OD 2002

- (a) Eunice Kennedy Shriver

Eunice Kennedy Shriver founded the Special Olympics, aiming to empower individuals with intellectual disabilities through competitive sports. Her vision created opportunities for participation, fostered social inclusion, and promoted physical fitness, thereby transforming perceptions of disability on a global scale remarkably.

11. The first Deaflympics Games were held in the year

- (a) 1924
- (b) 1948
- (c) 1954
- (d) 1988

Ans :

FOREIGN 2004

- (a) 1924

The first Deaflympics Games were held in 1924, providing a dedicated international sporting event for deaf athletes. This historic competition marked a milestone in promoting accessibility, inclusivity, and the recognition of deaf athletes in the global sporting community with success.

12. Grouping process associated with Paralympics is referred as :

- (a) Divisioning
- (b) Classification
- (c) Grouping
- (d) Categorization

Ans :

SQP 2020

- (b) Classification

The grouping process in Paralympics is known as classification, which involves evaluating athletes' abilities. This process ensures fair competition by grouping athletes with similar impairments, allowing them to compete on an equitable basis in sports in multiple international events successfully.

13. Grouping process associated with Special Olympics is referred as?

- (a) Divisioning
- (b) Classification
- (c) Grouping
- (d) Categorization

Ans :

COMP 2014

- (c) Grouping

In Special Olympics, the grouping process is referred to simply as grouping, where athletes are organized based on age, skill level, and ability. This approach promotes competitive balance and ensures that participants compete with others of similar performance capabilities equitably.

14. Rule used by Special Olympics to achieve the intentions of fairness is referred as :

- (a) Maximum Effort Rule
- (b) Honest Effort Rule
- (c) Best Effort Rule
- (d) Minimum Effort Rule

Ans :

DELHI 2011

- (b) Honest Effort Rule

The Special Olympics adopt the Honest Effort Rule, which requires athletes to perform to the best of their abilities without external assistance. This rule ensures fairness by promoting competition, encouraging participants to strive for personal bests in a supportive environment.

15. Which is the first step used in classification for Paralympics

- (a) Medical Assessment
- (b) Functional Assessment
- (c) Observation
- (d) Competition

Ans :

OD 2006

- (a) Medical Assessment

The initial step in the Paralympic classification process is a medical assessment, where medical professionals evaluate the type and extent of an athlete's impairment. This assessment forms the basis for further functional tests and helps determine fair competition categories effectively.

16. Inclusion is vast concept that implies

- (a) including learners with differing abilities, appearance and economic conditions in education
- (b) including learners with an emotional or intellectual impairment in mainstream education
- (c) integrating all children with intellectual disabilities into main stream schooling
- (d) integrating all children with physical disabilities into mainstream schooling

Ans :

FOREIGN 2001

41. Which strategy involves training coaches specifically to work with children with special needs?

- (a) General coaching practices
- (b) Specialized coach training
- (c) Ignoring adaptive techniques
- (d) Standard training only

Ans :

FOREIGN 2006

(b) Specialized coach training

Specialized coach training involves educating coaches on adaptive techniques and inclusive practices for children with special needs. This strategy enhances coaching skills, improves communication, and equips instructors to create safe, effective, enjoyable sports environments for all participants in a team.

42. Which strategy emphasizes the importance of accessible facility modifications for CWSN?

- (a) Maintaining existing infrastructure
- (b) Infrastructure modification
- (c) Reducing facility access
- (d) Ignoring accessibility needs

Ans :

SQP 2001

(b) Infrastructure modification

Infrastructure modification is a strategy for making sports accessible to children with special needs. It involves adapting facilities, improving accessibility features such as ramps and elevators, and ensuring that sports venues are designed to accommodate physical requirements for inclusive participation.

43. Which strategy emphasizes peer support to enhance sports participation for CWSN?

- (a) Isolation programs
- (b) Peer mentoring programs
- (c) Individual training only
- (d) Competitive exclusion

Ans :

COMP 2004

(b) Peer mentoring programs

Peer mentoring programs emphasize the importance of support among children with special needs. By pairing them with peers, these programs foster social connections, encourage skill development, and build confidence, thereby promoting participation in sports and inclusive community engagement. This supportive framework significantly improves self-esteem and motivation among all participants in physical education globally.

44. Which approach focuses on individualized instruction tailored to each child's abilities in sports?

- (a) One-size-fits-all training
- (b) Individualized instruction
- (c) Group coaching only
- (d) Standard curriculum

Ans :

DELHI 2010

(b) Individualized instruction

Individualized instruction tailors sports training to the specific abilities and needs of each child with special needs. This personalized approach ensures that children receive appropriate challenges and support, leading to skill development, increased participation, and enhanced learning outcomes in sports.

45. Which technological tool can enhance accessibility for CWSN in sports?

- (a) Standard equipment
- (b) Adaptive wearables
- (c) Outdated devices
- (d) Conventional gear

Ans :

OD 2012

(b) Adaptive wearables

Adaptive wearables, such as smart sensors and assistive devices, enhance accessibility by monitoring performance and providing feedback for children with special needs. These technologies support individualized training, improve safety, and encourage participation by addressing unique physical challenges during sports activities.

46. Which collaboration strategy can improve accessibility in sports for CWSN?

- (a) Working alone
- (b) Collaboration with special educators
- (c) Avoiding expert input
- (d) Isolating programs

Ans :

FOREIGN 2005

(b) Collaboration with special educators

Collaboration with special educators is a vital strategy to enhance accessibility in sports for children with special needs. This partnership integrates educational insights, adaptive techniques, and support, ensuring that sports programs are inclusive, effective, and responsive to diverse learning requirements.

The Paralympics is a prestigious international multi-sport event organized for athletes with physical disabilities. It showcases exceptional athletic abilities, promotes equal opportunities, and fosters social inclusion by celebrating adaptive sports through rigorous competition, inspiring millions globally with widespread global admiration.

- 23.** Which organization focuses on sports for the deaf community, hosting events tailored for athletes with hearing impairments?

(a) Special Olympics
(b) Paralympics
(c) Deaflympics
(d) Invictus Games

Ans :

COMP 2010

(c) Deaflympics

Deaflympics is an international sporting event for athletes with hearing impairments. It provides a competitive platform that celebrates the skills of deaf athletes, promotes equality, and encourages integration, ensuring that communication barriers do not hinder athletic achievement worldwide with success.

- 24.** What does the concept of classification in sports for CWSN primarily involve?

(a) Grouping athletes by age
(b) Grouping athletes by disability type and level
(c) Grouping athletes by gender
(d) Grouping athletes by weight

Ans :

DELHI 2007

(b) Grouping athletes by disability type and level
Classification in sports for children with special needs involves grouping athletes based on the type and severity of their disability. This ensures fair competition by matching individuals with similar functional abilities, creating an equitable environment for athletic performance and development.

- 25.** What does divisioning in sports for CWSN primarily entail?

(a) Dividing by sport type
(b) Dividing by performance levels
(c) Dividing by disability category and degree
(d) Dividing by coaching style

Ans :

OD 2017

(c) Dividing by disability category and degree
Divisioning in sports for children with special needs involves segregating athletes into divisions

based on specific disability categories and their degree of impairment. This process ensures that competitions remain balanced, equitable, and focused on fair athletic opportunities for all participants.

- 26.** What does inclusion in sports primarily refer to?
- (a) Separating athletes
(b) Integrating athletes with special needs into mainstream sports
(c) Focusing on elite performance
(d) Promoting individual sports only

Ans :

FOREIGN 2003

(b) Integrating athletes with special needs into mainstream sports

Inclusion in sports refers to integrating children with special needs into mainstream athletic programs. It emphasizes equal opportunities, accessible facilities, and supportive environments that encourage participation, fostering mutual respect and enhancing physical, social, and emotional development among all athletes globally.

- 27.** Why is inclusion in sports important for children with special needs?

(a) It isolates them
(b) It promotes segregation
(c) It enhances social integration and physical health
(d) It increases competition stress

Ans :

SQP 2009

(c) It enhances social integration and physical health

Inclusion in sports enhances overall well-being for children with special needs by promoting social integration, improving physical fitness, and boosting self-confidence. It provides opportunities for interaction, skill development, and emotional support, thereby reducing stigma and creating a healthier, more cohesive community.

- 28.** Which advantage of physical activities for CWSN is directly related to improved physical fitness?

(a) Increased isolation
(b) Improved coordination and strength
(c) Reduced social skills
(d) Lower endurance

Ans :

COMP 2007

(b) Improved coordination and strength
Physical activities for children with special needs improve overall physical fitness by enhancing

(a) including learners with differing abilities, appearance and economic conditions in education
Inclusion refers to an educational approach that embraces learners with diverse abilities, appearances, and economic backgrounds. It promotes equitable access to quality education by integrating all students into mainstream classrooms, thereby fostering social interaction, mutual respect, and overall personal development.

- 17.** Right to education provides free education for all children within the age group of :
- 5-10yrs
 - 6-14 yrs
 - 10-18 yrs
 - 2-7 yrs

Ans :

SQP 2019

- (b) 6-14 yrs

The right to education typically ensures that free and compulsory education is provided for children aged 6 to 14 years. This age range is considered critical for foundational learning and development, establishing the basis for future academic and personal success.

- 18.** Which of the following will be an inclusive school:
- Mainstream school with separate classrooms for different abilities
 - Mainstream school with same classrooms for different abilities
 - Separate schools for Mainstream and for children with disability
 - All of the above

Ans :

COMP 2005

- (b) Mainstream school with same classrooms for different abilities

An inclusive school is one where students of varying abilities learn together in the same classroom environment. This approach encourages mutual learning, empathy, and collaboration, breaking down barriers and ensuring equal opportunities for all children regardless of their abilities universally.

- 19.** Development of Gross Motor and Fine Motor skills are benefits which are part of :
- Physical benefits
 - Mental benefits
 - Social benefits
 - Emotional benefits

Ans :

DELHI 2008

- (a) Physical benefits

Developing gross motor and fine motor skills through physical education constitutes a significant physical benefit. These activities enhance coordination, balance, and strength, thereby contributing to improved overall health, functional independence, and athletic performance in both academic and daily life settings.

- 20.** Graded activities as strategy for effective inclusive physical education program includes:
- Complex to simple activities
 - Simple to complex activities
 - Challenging abilities
 - None of the above

Ans :

OD 2006

- (b) Simple to complex activities

Graded activities in inclusive physical education begin with simple tasks and progressively advance to more complex activities. This strategy allows all students to build confidence, master fundamental skills, and tackle challenges, ensuring an adaptive learning environment for every participant effectively.

- 21.** Which organization is dedicated to sports for individuals with intellectual disabilities, promoting global inclusion?
- Paralympics
 - Special Olympics
 - Deaflympics
 - Invictus Games

Ans :

FOREIGN 2018

- (b) Special Olympics

Special Olympics is a globally recognized organization dedicated to sports for individuals with intellectual disabilities. It promotes inclusion, health, and empowerment through athletic competitions, training programs, and community engagement initiatives, thereby enhancing self-esteem, fitness, and social integration across the globe.

- 22.** Which organization organizes sports events for athletes with physical disabilities in an international multi-sport event?
- Special Olympics
 - Paralympics
 - Deaflympics
 - Invictus Games

Ans :

SQP 2015

- (b) Paralympics

35. What is the primary focus of inclusion in sports for CWSN?

- (a) Isolating athletes
- (b) Integrating them into mainstream activities
- (c) Separating training sessions
- (d) Limiting participation

Ans :

OD 2014

(b) Integrating them into mainstream activities
Inclusion in sports for children with special needs focuses on integrating them into mainstream activities. This approach fosters social interaction, equal opportunity, and shared learning experiences, breaking down barriers and building an environment where all athletes participate together harmoniously.

36. Why is inclusion in sports necessary for children with special needs?

- (a) It increases segregation
- (b) It promotes social isolation
- (c) It encourages physical, emotional, and social development
- (d) It limits skill development

Ans :

FOREIGN 2016

(c) It encourages physical, emotional, and social development

Inclusion in sports is necessary for children with special needs because it encourages comprehensive development. It improves physical fitness, enhances emotional resilience, and fosters social skills. By participating with peers, these children experience improved self-esteem, communication, and overall quality of life.

37. Which advantage of physical activity for CWSN relates to improved self-confidence?

- (a) Increased dependency
- (b) Improved self-esteem
- (c) Heightened anxiety
- (d) Social withdrawal

Ans :

SQP 2018

(b) Improved self-esteem

Improved self-esteem is a key advantage of physical activity for children with special needs. Regular exercise and sports participation empower them through skill development, social interaction, and achievement. This positive reinforcement builds confidence, reducing anxiety and promoting independence in various life aspects.

38. Which advantage of physical activity for CWSN involves better motor coordination?

- (a) Reduced agility
- (b) Enhanced motor skills
- (c) Increased clumsiness
- (d) Diminished reflexes

Ans :

COMP 2020

(b) Enhanced motor skills

Enhanced motor skills result from regular physical activity among children with special needs. Engaging in sports develops coordination, balance, and agility. This improvement in motor function not only benefits athletic performance but also translates into better daily functioning and greater independence overall.

39. Which strategy improves accessibility by modifying sports equipment for CWSN?

- (a) Standard equipment usage
- (b) Adaptive equipment modifications
- (c) Unchanged equipment
- (d) Removing all equipment

Ans :

DELHI 2017

(b) Adaptive equipment modifications

Adaptive equipment modifications improve accessibility by tailoring sports gear to meet the specific needs of children with special needs. These adaptations make equipment easier to use, safer, and more effective, thereby promoting active participation and enhancing overall performance in inclusive sports.

40. Which strategy involves modifying game rules to accommodate children with special needs?

- (a) Strict adherence to standard rules
- (b) Rule modification
- (c) Eliminating rules
- (d) Ignoring special needs

Ans :

OD 2009

(b) Rule modification

Rule modification is an effective strategy to accommodate children with special needs in sports. By adapting game rules to suit varying abilities, it ensures that competitions remain fair and accessible, allowing participants to engage, compete, enjoy sports in an environment that supports their unique requirements.

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4. Which is the main governing body responsible for the organisation of Deaflympics?
- World Deaf Champions Committee
 - National Sports Federation
 - International Co-ordinating Committee Sports for Disabled
 - International Committee of Sports for the Deaf

Ans :

2024

(d) The International Committee of Sports for the Deaf

The International Committee of Sports for the Deaf is the principal organization responsible for organizing the Deaflympic Games. It oversees the event's operations and ensures that deaf athletes have equal opportunities to compete internationally in a fair and supportive environment.

5. Watching others play and enjoy which in turn motivates the Child with Special Need to participate is a part of which kind of strategy?
- Mental
 - Physical
 - Psychological
 - Social

Ans :

2022-23

(d) Social

Observing others enjoying and participating in sports creates a social influence that encourages children with special needs to join in. This strategy leverages peer modeling and social interaction to boost motivation, demonstrating the positive aspects of active participation.

6. School management needs to recognise the essential place of physical activity in the education of children with special needs. Which of these is not one of the results of physical activities in children with special needs?
- Improvement in confidence
 - Improvement in endurance
 - Increase in depression
 - Better hand-eye coordination

Ans :

2023-24

(c) Increase in depression.

Physical activity in children with special needs typically results in improved confidence, endurance, and better hand-eye coordination. An increase in depression is not a beneficial outcome; instead, regular exercise generally enhances emotional well-being and mental health among

these children.

7. The International Paralympics Committee was founded in the year
- 1960
 - 1948
 - 1900
 - 1989

Ans :

(d) 1989

The International Paralympics Committee was established in 1989 to unify and organize sports competitions for athletes with disabilities worldwide. Its formation marked a significant milestone, ensuring that Paralympic sports received governance and support, enhancing global recognition and fairness in competition.

8. The reason Paralympic Games got their name was because
- they were meant for athletes suffering from paraplegia.
 - they run alongside or parallel to the Olympic Games.
 - the athletes are paragons of their sports.
 - they are attended by a large number of paramedics.

Ans :

COMP 2016

(b) they run alongside or parallel to the Olympic Games.

The Paralympic Games derive their name because they are held parallel to the Olympic Games, following the Olympics in the same host cities. This scheduling emphasizes their connection to the Olympic spirit while providing a platform for athletes with disabilities.

9. Paralympic Games was a 1948 sporting competition held at Stoke Mandeville hospital in
- England
 - United States of America
 - Germany
 - Greece

Ans :

DELHI 2013

(a) England

The 1948 sporting competition at Stoke Mandeville Hospital in England, known as the Stoke Mandeville Games, served as a precursor to the Paralympic Games. This event was fundamental in successfully promoting sports and laid the groundwork for future Paralympic events.

- 47.** Which community engagement strategy can enhance sports participation for CWSN?

(a) Isolation programs
(b) Community sports festivals
(c) Excluding families
(d) Avoiding local involvement

Ans :

SQP 2011

(b) Community sports festivals

Community sports festivals bring together children with special needs, their families, and local communities. These events foster social integration, celebrate diversity, and create supportive networks that encourage participation, skill development, and mutual understanding in a vibrant, inclusive athletic environment together.

- 48.** Which role do parents play in promoting inclusive physical education for CWSN?

(a) Passive observers
(b) Active supporters
(c) Excluding influence
(d) Uninvolved parties

Ans :

COMP 2013

(b) Active supporters

Parents play a crucial role as active supporters in promoting inclusive physical education for children with special needs. Their involvement in advocacy and encouragement ensures that their children have access to adaptive sports programs and benefit from learning environments significantly, improving outcomes.

- 49.** Which model emphasizes removing environmental barriers to promote sports participation for CWSN?

(a) Medical model
(b) Social model
(c) Performance model
(d) Competitive model

Ans :

DELHI 2017

(b) Social model

The social model of disability emphasizes removing environmental barriers and promoting accessibility in sports. It advocates for changes in society to accommodate individuals with special needs, ensuring that physical education and sports become available to all regardless of disability, universally.

- 50.** Which model contrasts the social model by focusing on individual impairments in disability sports?

(a) Medical model
(b) Social model
(c) Performance model
(d) Inclusive model

Ans :

OD 2009

(a) Medical model

The medical model of disability focuses on individual impairments and deficits rather than environmental barriers. It tends to view disability as a problem within the individual, emphasizing treatment and rehabilitation rather than societal changes to accommodate physical and cognitive needs.

- 51.** Which factor contributes significantly to overcoming stigma in disability sports?

(a) Increased isolation
(b) Public awareness campaigns
(c) Reducing participation
(d) Segregating athletes

Ans :

FOREIGN 2006

(b) Public awareness campaigns

Public awareness campaigns play a significant role in overcoming stigma in disability sports. By educating society about the abilities and achievements of athletes with special needs, these campaigns foster acceptance, reduce misconceptions, and promote a culture of inclusion and respect.

- 52.** Which approach emphasizes adaptive training techniques for children with special needs?

(a) Standard training
(b) Adaptive training
(c) Competitive training
(d) Rigid training

Ans :

SQP 2001

(b) Adaptive training

Adaptive training techniques emphasize modifying exercises, routines, and activities to suit the individual abilities of children with special needs. This approach ensures that training is safe, effective, and enjoyable, leading to improved performance, increased motivation, and higher levels of participation.

- 53.** Which policy framework is essential for supporting disability sports at the national level?

(a) Exclusion policies
(b) Inclusive sports policies
(c) Financial restrictions
(d) None of the above

coordination, strength, and motor skills. Regular exercise builds endurance, refines balance, and increases flexibility, ultimately contributing to better health, confidence, and independence in daily life and sports.

- 29.** Which benefit of physical activities for CWSN is associated with enhanced social interaction?
- Increased isolation
 - Enhanced peer relationships
 - Reduced teamwork
 - Lower self-esteem

Ans :

DELHI 2003

(b) Enhanced peer relationships
Engaging in physical activities enhances peer relationships by fostering social interaction among children with special needs. Participating in group sports builds friendships, improves communication skills, and develops teamwork, which contributes to higher self-esteem and a more integrated, supportive social network.

- 30.** Which strategy is effective for making physical activities accessible to CWSN by modifying equipment and rules?
- Using standardized equipment
 - Modifying equipment and rules
 - Increasing competition intensity
 - Eliminating adaptive techniques

Ans :

OD 2008

(b) Modifying equipment and rules
Modifying equipment and rules is a key strategy to ensure accessibility for children with special needs. Adaptive equipment and flexible game rules allow adjustments based on individual abilities, ensuring fair play, increased participation, and improved skill development in inclusive sports environments.

- 31.** Which organization organizes the Special Olympics?
- Paralympics Committee
 - Special Olympics Organization
 - Deaflympics Committee
 - Invictus Foundation

Ans :

FOREIGN 2006

(b) Special Olympics Organization
The Special Olympics Organization specifically organizes sports events for individuals with intellectual disabilities. It focuses on athletic training, competition, and social inclusion, thereby enhancing the lives of participants through

opportunities that build self-esteem, physical fitness, and community integration worldwide.

- 32.** Which international event is specifically designed for athletes with physical disabilities?
- Special Olympics
 - Paralympics
 - Deaflympics
 - Invictus Games

Ans :

SQP 2002

(b) Paralympics
The Paralympics is an international event exclusively designed for athletes with physical disabilities. It provides a platform for high-level competition, fosters adaptive sports development, and promotes global inclusion, encouraging participants to excel and inspiring societies through remarkable athletic achievements.

- 33.** What is the primary goal of classification in disability sports?
- To increase competition
 - To group athletes by similar functional abilities
 - To separate athletes by age only
 - To focus on weight categories

Ans :

COMP 2015

(b) To group athletes by similar functional abilities
The primary goal of classification in disability sports is to group athletes by similar functional abilities. This process minimizes disparities arising from different disability levels, ensuring fair competition, equitable opportunities, and balanced challenges for athletes in all sports events.

- 34.** Which concept ensures that athletes with varying disabilities compete fairly against one another?
- Segregation
 - Classification and divisioning
 - Random grouping
 - Exclusive competitions

Ans :

DELHI 2019

(b) Classification and divisioning
Classification and divisioning ensure fair competition by grouping athletes with similar disabilities together. This system minimizes performance disparities, creates a level playing field, and promotes equitable competition, ultimately enhancing the integrity and fairness of sports events for all participants.

and strengthens social bonds, reduces stigma, and creates a supportive network that benefits all members of the community with lasting impact.

- 60.** Which outcome is expected from long-term inclusive physical education for CWSN?

- (a) Improved overall health and well-being
- (b) Declined physical skills
- (c) Increased isolation
- (d) Reduced cognitive function

Ans :

OD 2012

(a) Improved overall health and well-being
Long-term inclusive physical education for children with special needs results in improved overall health and well-being. It enhances physical fitness, emotional stability, and social skills, leading to academic performance and increased opportunities for personal growth and active participation in society.

- 61. Assertion (A) :** Organizations like Special Olympics, Paralympics, and Deaflympics play a vital role in promoting sports among children with special needs by offering tailored competitive platforms.

Reason (R) : These organizations structure their events to ensure competitive equality by grouping athletes based on similar functional abilities.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2015

(a) Both A and R are true, and R is the correct explanation for A.

Both statements are accurate. These organizations create events that not only foster participation but also ensure fairness through classification, allowing children with similar functional abilities to compete on an equal footing, which supports the assertion fully.

- 62. Assertion (A) :** The concept of classification and divisioning in sports is crucial for ensuring fair competition among athletes with disabilities.

Reason (R) : Classification in disability sports is determined solely by an athlete's medical diagnosis rather than by their functional performance.

- (a) Both A and R are true, and R is the correct explanation for A.

- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2011

- (c) A is true but R is false.

While the assertion correctly states that classification promotes fairness, the reason is false. Classification considers functional ability and performance rather than being based solely on a medical diagnosis, ensuring that athletes compete against others with comparable capabilities.

- 63. Assertion (A) :** Inclusive sports programs integrate children with special needs into mainstream sports, fostering social interaction and holistic development.

Reason (R) : Inclusion in sports guarantees that all children receive equal physical, mental, and social benefits without any need for specialized modifications.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2013

- (c) A is true but R is false.

The assertion is correct as inclusive programs promote social acceptance and development. However, the reason is false because, in practice, specialized modifications and supports are often necessary to ensure that children with special needs fully benefit from mainstream sports.

- 64. Assertion (A) :** Regular physical activity enhances motor skills, self-esteem, and social interaction in children with special needs.

Reason (R) : Physical activities for children with special needs only improve physical fitness without impacting their cognitive or social development.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2015

- (c) A is true but R is false.

training, equipment demonstrations, and peer mentorship. Such clinics can bridge the gap between professional adaptive sports programs and everyday school activities, thereby increasing participation, skill development, and community awareness.

NODIA

THREE MARKS QUESTIONS

- 107.** Define disability and list down any two types of disability.

Ans :

Term-II, 2021-22

A disability is a physical or mental condition that restricts a person's movement, senses, and activities. This means that an individual may lose all or part of the function of a specific body part. Disabilities can result from illnesses, accidents, or genetic factors, and they may limit a person's ability to speak, learn, communicate, or even move. Various types of disabilities include physical and intellectual impairments, learning challenges, physical disfigurements, sensory deficits, mental illnesses, and neurological disorders.

- 108.** Write any two advantages of physical activities for Children With Special Needs (CWSN).

Ans :

2024

Two advantages of physical activities for Children with Special Needs (CWSN) include:

1. **Physical Improvements:** Children with cognitive disabilities often face physical challenges, including difficulties with motor skills. Engaging in activities such as hopping, skipping, and jumping helps develop their basic motor abilities and overall physical fitness.
2. **Self-Esteem:** Building self-esteem and confidence is a crucial aspect of special education. When children participate in group activities, they not only boost their self-image but also gain increased confidence through active contribution.

- 109.** List down any two strategies to make physical activities accessible for CWSN.

Ans :

Term-II, 2021-22

Strategies to Make Physical Activities Accessible for Children with Special Needs (CWSN):

1. **Interest:** Design activities that align with the interests, abilities, and limitations of each child to ensure optimal participation.
2. **Ability:** Take into account the physical and mental conditions of the children when planning activities.
3. **Medical Check-Up:** Conduct a thorough medical examination of all children to understand their specific disabilities before initiating any activity.
4. **Pre-Experiences:** Consider each child's previous experiences and work on building their comfort level and confidence before finalizing physical activity strategies.

- 110.** Explain any three strategies to make physical activities accessible for CWSN.

Ans :

2023-24

1. **Communication:** Provide clear, advance information about the activity, including details about the space, resource person, or any changes. Use a mix of instructional methods—verbal, visual, and peer teaching—to ensure all children have the opportunity to participate fully.
2. **Space:** Ensure that the activity area is accessible for individuals with physical disabilities. Keep the space defined and free from disturbances such as noise, extreme temperatures, unsuitable floor textures, or distracting audiences. Starting with an indoor environment is often ideal.
3. **Equipment:** The availability of proper equipment, along with professionals trained to support children with diverse abilities, is crucial. A shortage in these areas can discourage participation in physical activities.

- 111.** Identify and describe the role of major organizations that promote disability sports, such as the Special Olympics, Paralympics, and Deaflympics. How do these organizations contribute to the empowerment of children with special needs?

Ans :

FOREIGN 2016

Major organizations in disability sports include:

1. **Special Olympics:**
 - i. **Role:** Provides year-round sports training and competition for children and adults with intellectual disabilities.
 - ii. **Contribution:** Empowers participants by fostering self-confidence, enhancing social

69. Which international sporting organization does this symbol represent?



- (a) The International Olympic Committee (IOC)
- (b) The International Paralympic Committee (IPC)
- (c) The International Cricket Council (ICC)
- (d) The Fédération Internationale de Football Association (FIFA)

Ans :

DELHI 2020

- (b) The International Paralympic Committee (IPC)

The symbol represents the International Paralympic Committee (IPC), featuring three Agitos (colored swooshes) encircling a central point, symbolizing movement and the Paralympic values of courage, determination, inspiration, and equality.

70. How many curved shapes (often called “agitos”) are present in the Paralympic symbol?

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Ans :

OD 2007

- (b) 3

The Paralympic symbol is composed of three agitos. Each agito is a curved shape that seems to swirl around a central point, representing movement and progress.

71. What do the three colors of the Paralympic symbol (red, blue, and green) represent?

- (a) The most commonly used colors in national flags
- (b) The three most popular Paralympic sports
- (c) A tribute to the original Olympic rings
- (d) Colors of the host country for the Paralympics

Ans :

FOREIGN 2003

- (a) The most commonly used colors in national flags

Red, blue, and green were chosen because they

are the most frequently used colors in the flags of countries around the world, symbolizing global inclusion.

72. Which international organization does this symbol represent?



- (a) International Olympic Committee (IOC)
- (b) International Paralympic Committee (IPC)
- (c) Special Olympics
- (d) United Nations Educational, Scientific and Cultural Organization (UNESCO)

Ans :

SQP 2008

- (c) Special Olympics

The symbol with stylized figures forming a circle is the logo of Special Olympics, an organization that provides year-round sports training and athletic competitions for children and adults with intellectual disabilities.

73. How many stylized figures are depicted in the Special Olympics logo?

- (a) 3
- (b) 5
- (c) 7
- (d) 9

Ans :

COMP 2006

- (b) 5

The logo features five human-like figures arranged in a circular pattern, symbolizing unity, joy, and the coming together of athletes from around the world.

74. In a _____ Tournament, a player or team continues to play matches until it is defeated.

- (a) League
- (b) Round Robin
- (c) Knock-Out
- (d) Combination

Ans :

DELHI 2002

- (c) Knock-Out

Knock-Out tournament is a format where a player or team is eliminated from the competition after a single defeat.

75. The postural deformity known as Flat foot, where there is no arch in the feet, is also known as _____ or fallen arches.
- Genu valgum
 - Kyphosis
 - Genu varum
 - Pes planus

Ans :

OD 2010

(d) Pes planus
Flat foot is medically referred to as 'pes planus' or 'fallen arches'.

76. A _____ is a soft tissue injury to a muscle or a tendon that is generally caused by overuse, force, or stretching.
- Sprain
 - Strain
 - Contusion
 - Abrasion

Ans :

FOREIGN 2012

(b) Strain
Strain is a injury that specifically affects a muscle or a tendon, often due to overstretching or excessive force.

77. Newton's Second Law of Motion, which relates force, mass, and acceleration, is also known as the Law of _____.
- Inertia
 - Reaction
 - Momentum
 - Equilibrium

Ans :

SQP 2015

(c) Momentum
Newton's Second Law deals with the rate of change of momentum being proportional to the force applied, and is therefore also called the Law of Momentum.

78. According to Jung's classification, a person who is predominantly interested in their own mental self and is typically more reserved or reflective is known as an _____.
- Extrovert
 - Ambivert
 - Introvert
 - Somatotype

Ans :

COMP 2011

(c) Introvert

Carl Jung's theory introvert as someone who is focused on their own inner world of thoughts and feelings.

79. Which international sporting event does this symbol represent?



- Olympic Games
- Paralympic Games
- Special Olympics
- Deaflympics

Ans :

DELHI 2013

(d) Deaflympics

The Deaflympics, officially recognized by the International Olympic Committee (IOC), is a multi-sport event specifically for athletes who are Deaf or hard of hearing. This colorful hand-shaped emblem is its official logo.

80. Match the event or organization in List-I with its founder or origin in List-II.

	List-I (Event/ Organization)		List-II (Founder/ Origin/Year)
(a)	Stoke Mandeville Games	(i)	Eunice Kennedy Shriver
(b)	Special Olympics	(ii)	Dr. Ludwig Guttmann
(c)	Deaflympics	(iii)	Formed on 22nd September 1989
(d)	International Paralympic Committee (IPC)	(iv)	First held in Paris, 1924

Select the correct option from the following:

- (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
- (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
- (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
- (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

Ans :

OD 2015

(B) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Dr. Ludwig Guttman started the Stoke Mandeville Games, the forerunner to the Paralympics. Eunice Kennedy Shriver initiated the first Special Olympics. The Deaflympics were first held in Paris in 1924, and the IPC was formed in 1989.

- 81.** Match the Paralympic impairment category in List-I with its correct description in List-II.

	List-I (Impairment Type)		List-II (Description)
(a)	Hypertonia	(i)	Lack of coordination of muscle movements
(b)	Ataxia	(ii)	Unbalanced, involuntary movements and difficulty maintaining a symmetrical posture
(c)	Athetosis	(iii)	Reduced standing height due to shortened limbs, arms, and trunk
(d)	Short Stature	(iv)	Abnormal increase in muscle tension and reduced ability of a muscle to stretch

Select the correct option from the following:

- (A) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
 (B) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
 (C) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 (D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

Ans :

FOREIGN 2019

(D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

Hypertonia is an abnormal increase in muscle tension. Ataxia is a lack of muscle coordination. Athetosis involves unbalanced, involuntary movements. Short Stature is reduced height due to shortened body parts.

- 82.** Match the Special Olympics program in List-I with its specific focus in List-II.

	List-I (Program)		List-II (Focus)
(a)	Young Athlete Programme	(i)	Offers health screenings to athletes

(b)	Unified Sports Programme	(ii)	For children aged 2-7 with a focus on motor skills
(c)	Healthy Athletes Programme	(iii)	Brings together athletes with and without disabilities as teammates
(d)	Maximum Effort Rule	(iv)	A rule for fairness in the divisioning process

Select the correct option from the following:

- (A) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
 (B) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)
 (C) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
 (D) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

Ans :

SQP 2014

(C) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)

The Young Athlete Programme is for children aged 2-7. The Unified Sports Programme creates teams of athletes with and without disabilities. The Healthy Athletes Programme provides health screenings. The Maximum Effort Rule ensures fairness during divisioning.

- 83.** Match the concept in List-I with the organization it is associated with in List-II.

List-I (Concept/Term)		List-II (Associated Organization)
(a)	Divisioning	(i) Paralympics
(b)	Classification	(ii) Special Olympics
(c)	Stoke Mandeville Games	(iii) Deaflympics
(d)	International Silent Games	(iv) Forerunner to the Paralympics

Select the correct option from the following:

- (A) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (B) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
 (C) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (D) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

Ans :

COMP 2016

(A) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Divisioning is the grouping method used by the Special Olympics. Classification is the term used by the Paralympics for grouping athletes by impairment. The Stoke Mandeville Games were the direct forerunner to the Paralympics. The International Silent Games were the original name for the Deaflympics.

The assertion is accurate as regular physical activity improves motor skills, self-esteem, and social interaction. The reason, however, is false because numerous studies show that exercise also positively affects cognitive and social development in children with special needs.

- 65. Assertion (A) :** Strategies such as adaptive equipment, modified rules, and personalized instruction are essential for making physical activities accessible to children with special needs.

Reason (R) : Standard sports programs naturally accommodate children with special needs without requiring any adaptations.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2019

- (c) A is true but R is false.

The assertion correctly highlights that adaptive strategies are necessary to ensure accessibility. The reason is false because standard sports programs typically do not meet the unique needs of children with special needs, necessitating thoughtful modifications for full participation.

- 66. Assertion (A) :** The Deaflympics is a dedicated global event that encourages competitive sports among deaf athletes and supports their specialized training needs.

Reason (R) : Deaf athletes usually participate in mainstream events without any modifications, making a separate event redundant.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2014

- (c) A is true but R is false.

The assertion is true as the Deaflympics offers a specialized competitive environment for deaf athletes. The reason is false because deaf athletes benefit from events tailored to their communication and sensory needs, rather than competing in unmodified mainstream events.

- 67. Assertion (A) :** Implementing inclusive sports programs in schools fosters acceptance, reduces stigma, and promotes overall well-being for children with special needs.

Reason (R) : Inclusive sports programs are easily implemented in all schools without significant adjustments or resources.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2016

- (c) A is true but R is false.

While the assertion correctly emphasizes the benefits of inclusive sports in promoting acceptance and well-being, the reason is false. Implementing these programs often requires considerable adjustments, specialized training, and resources, challenging the notion that they are universally easy to implement.

- 68. Assertion (A) :** The concept of classification in disability sports ensures that athletes compete on a level playing field by grouping them based on similar functional abilities.

Reason (R) : Classification systems consider only the type of disability rather than the degree of functional impairment.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2018

- (c) A is true but R is false.

The assertion is correct because classification is designed to promote fair competition. However, the reason is false; modern classification systems evaluate the degree of functional impairment rather than just the type of disability, ensuring that athletes compete against peers with similar capabilities.

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the nature and severity of their disabilities to ensure fair competition.

- Importance : This system is crucial for children with special needs as it creates a level playing field, allowing them to compete with peers who have similar abilities and challenges, thereby enhancing their competitive experience and self-confidence.

- 90.** Explain the concept of Inclusion in Sports and discuss its need and methods of implementation.

Ans : DELHI 2006

- Concept : Inclusion in sports means integrating children with special needs into mainstream sporting activities, ensuring that they have equal opportunities to participate, learn, and compete.
- Need : It promotes social integration, reduces stigma, and enhances self-esteem by encouraging interaction with peers without disabilities.
- Implementation : Methods include adapting rules, modifying equipment, training coaches on inclusive practices, and designing programs that cater to various ability levels so that every child can participate meaningfully.

- 91.** List and explain two key advantages of physical activities for children with special needs.

Ans : OD 2004

- Improved Physical Health : Regular physical activity enhances strength, balance, flexibility, and cardiovascular fitness, which are especially beneficial in reducing secondary complications associated with disabilities.
- Enhanced Social and Emotional Development: Participation in sports fosters teamwork, communication skills, and self-confidence, while also reducing social isolation by encouraging interaction with peers in a supportive environment.

- 92.** Describe two strategies that can be used to make physical activities more accessible for children with special needs.

Ans : FOREIGN 2009

- Adaptive Equipment and Facilities : Modifying sports equipment (such as using lighter balls or wheelchairs designed for sports) and ensuring that sports facilities are barrier-free helps create an environment where children with different abilities can participate safely

and effectively.

- Specialized Training Programs : Implementing training sessions for coaches and educators on adaptive sports techniques, as well as developing individualized physical education plans that consider each child's unique needs, can significantly improve accessibility and participation.

- 93.** Compare two organizations that promote disability sports.

Ans : SQP 2001

Special Olympics vs. Paralympics:

- Special Olympics : Primarily targets athletes with intellectual disabilities, offering inclusive community-based programs that focus on personal achievement and social integration.
- Paralympics : Focuses on athletes with various physical and sensory disabilities, providing a competitive platform at the international level to showcase high-performance sports and inspire societal change.

- 94.** Define Classification and Divisioning in sports and provide one example of how it benefits competition among CWSN.

Ans : COMP 2007

- Definition : This process involves assessing athletes based on their specific impairments and grouping them into categories that allow for equitable competition.
- Example : In wheelchair basketball, athletes are assigned a point system based on their functional abilities; teams must field players whose total points do not exceed a set limit. This ensures that teams are balanced and that all players have comparable physical capabilities, fostering fair competition.

- 95.** What does Inclusion in Sports mean for children with special needs? Discuss one method to successfully implement it in school physical education programs.

Ans : DELHI 2008

- Meaning : Inclusion in sports means providing opportunities for children with special needs to participate alongside their non-disabled peers in sports activities.
- Implementation Method : One effective method is to design integrated physical education classes that use modified games and activities. For instance, adapting soccer

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84. Match the strategy for making physical activities accessible in List-I with its description in List-II.

	List-I (Strategy)		List-II (Description)
(a)	Comm- unication	(i)	The area should be limited and free from disturbances like noise or heat.
(b)	Space	(ii)	Allow the child to choose a sport they enjoy to boost motivation.
(c)	Equipment	(iii)	Use a variety of instructional methods like verbal, visual, and peer teaching.
(d)	Social Strategies	(iv)	Can include modified devices like wheelchairs for recreation and sport.

Select the correct option from the following:

- (A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (B) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
 (C) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
 (D) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

Ans :

DELHI 2018

- (D) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

Effective Communication uses various strategies like visual and peer teaching. Proper Space for CWSN should be limited and disturbance-free. Accessible Equipment includes modified items like wheelchairs. Social Strategies include letting the child choose an enjoyable activity.

TWO MARKS QUESTIONS

85. What do you understand by 'Physical disability'?

Ans :

OD 2018

It refers to a restriction in a person's physical abilities, often caused by motor deficits or sensory impairments, which in turn can affect their mobility and manual dexterity.

86. What do you mean by Intellectual Disability?

Ans :

AI 2019

It is a disability marked by notable impairments

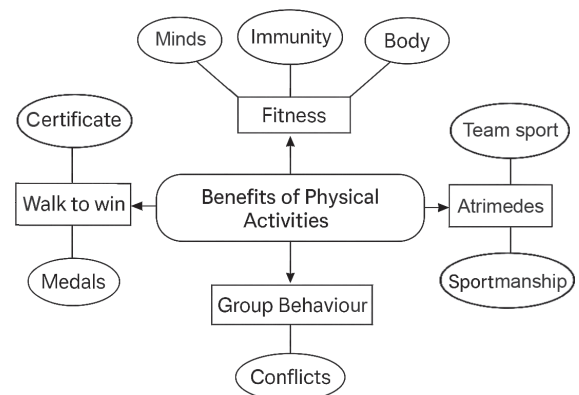
in intellectual abilities such as reasoning, learning, and problem-solving, as well as in adaptive behaviors, which include various everyday social and practical skills. It generally appears before the age of 18.

87. Create a mind map including any six advantages of physical activities for children with special needs.

Ans :

2022-23

Six advantages of physical activities for children with special needs



88. Describe three major organizations promoting disability sports and explain their primary focus.

Ans :

SQP 2020

1. Special Olympics: Focuses on providing year-round sports training and competition for children and adults with intellectual disabilities, aiming to build physical fitness, demonstrate courage, and share joy.
2. Paralympics: Organizes high-level international competitions for athletes with physical, visual, or intellectual impairments, emphasizing elite sports performance and the breaking of stereotypes.
3. Deaflympics: Caters to athletes who are deaf or hard of hearing, offering opportunities for competitive sports that emphasize communication through sign language and visual cues while promoting inclusivity.

89. What is meant by the concept of Classification and Divisioning in sports, and why is it important for CWSN?

Ans :

COMP 2017

1. Concept : Classification and divisioning refer to the process of grouping athletes based on

interactions due to increased confidence in their abilities.

- 102.** Describe two strategies that can be adopted to enhance the accessibility of physical activities for children with special needs and discuss their benefits.

Ans :

FOREIGN 2012

1. **Infrastructure Modifications:** Upgrading sports facilities to be wheelchair-accessible, installing ramps, and ensuring safe, non-slip surfaces can greatly enhance accessibility. This creates an inclusive environment that encourages participation and minimizes the risk of injury.
2. **Tailored Instruction and Support:** Training physical education teachers and coaches to use adaptive teaching methods, including visual aids, simplified instructions, and one-on-one support, can ensure that each child's unique needs are met. This personalized approach increases engagement, skill acquisition, and overall enjoyment of physical activities.

- 103.** Explain the concept of classification and divisioning in sports and discuss how it contributes to competitive equity among athletes with disabilities.

Ans :

SQP 2011

1. **Concept Classification** involves assessing an athlete's abilities and impairments to place them in a category that reflects their functional capacity. Divisioning further segments these groups to ensure that competitions are conducted between athletes with similar levels of ability.
2. **Contribution to Equity:** This system minimizes the risk of unfair advantages and mismatches, encouraging participation by ensuring that every athlete competes on a level playing field. It promotes confidence and enhances the overall competitive spirit by focusing on skill and dedication rather than the degree of impairment.

- 104.** What is the importance of inclusion in sports for children with special needs, and what practical steps can schools take to implement inclusive sports programs?

Ans :

COMP 2015

1. **Importance:** Inclusion in sports is crucial as it fosters social integration, builds self-

confidence, and improves both physical and mental health. It provides children with opportunities to learn teamwork and resilience in a supportive environment.

2. **Practical Steps:** Schools can implement inclusive programs by:
 - i. Adapting sports activities to suit diverse needs
 - ii. Training educators on adaptive sports techniques
 - iii. Establishing peer support systems and buddy programs
 - iv. Ensuring that facilities are accessible and equipped with adaptive sports equipment. These measures help create a nurturing environment where every child can participate and thrive.

- 105.** Discuss one significant physical and one social benefit of regular physical activity for children with special needs.

Ans :

DELHI 2014

1. **Physical Benefit:** Regular exercise can enhance cardiovascular health, strength, and flexibility. For instance, adaptive dance or swimming programs can improve coordination and muscle tone, leading to better overall physical well-being.
2. **Social Benefit:** Participation in sports fosters teamwork, communication, and friendship. By engaging in group activities, children with special needs develop social skills and experience a sense of belonging, which is critical for emotional development and self-esteem.

- 106.** Propose two innovative strategies to ensure that physical activities are accessible and enjoyable for children with special needs, and explain their potential impact.

Ans :

OD 2019

1. **Virtual and Augmented Reality Programs:** Using VR and AR technologies, schools and sports clubs can create immersive, interactive environments that adapt to each child's ability level. These tools can simulate various sports scenarios, enhance motor skills, and make practice sessions engaging and fun.
2. **Community-Based Adaptive Sports Clinics:** Organizing regular clinics in collaboration with local sports organizations and adaptive sports experts can provide specialized

rules or using visual aids can help ensure that every student, regardless of ability, can engage, learn, and benefit from the activity.

- 96.** Explain one physical and one social benefit of regular physical activity for children with special needs.

Ans :

OD 2002

1. **Physical Benefit :** Regular exercise enhances overall physical strength and coordination, which can help reduce the risk of obesity and improve motor skills.
2. **Social Benefit :** Being part of a team or group activity fosters a sense of belonging and encourages social interaction, reducing feelings of isolation and promoting friendships among peers.

- 97.** Suggest two practical strategies for making sports activities accessible for children with special needs and explain their potential impact.

Ans :

FOREIGN 2003

1. **Use of Adaptive Technology:** Incorporating adaptive tools such as sensory-friendly sports gear or specialized communication devices can help overcome specific barriers, making it easier for children to participate fully and safely.
2. **Inclusive Curriculum Design:** Developing an inclusive physical education curriculum that adapts traditional sports to accommodate varying abilities ensures that all children receive equal opportunities for physical activity. This can lead to improved self-confidence, skill development, and overall enjoyment of sports.

- 98.** Discuss the roles of Special Olympics, Paralympics, and Deaflympics in promoting sports among children with special needs.

Ans :

SQP 2006

1. **Special Olympics:** Provides structured sports training and competitive opportunities for children with intellectual disabilities, emphasizing skill development and community integration.
2. **Paralympics:** Offers a competitive arena for athletes with various physical impairments, highlighting excellence in sport and breaking societal stereotypes.
3. **Deaflympics:** Focuses on the unique needs of athletes who are deaf or hard of hearing

by offering competitions that utilize visual cues and sign language, thereby promoting inclusion and equal opportunity.

- 99.** What is the purpose of classification and divisioning in sports, and how does it ensure fairness in competitions for children with special needs?

Ans :

COMP 2010

1. **Purpose:** The main goal is to group athletes with similar levels of ability and impairment so that competitions are balanced and fair.
2. **Fairness Assurance:** By categorizing athletes based on functional abilities, these systems prevent mismatches that could discourage participation and ensure that every competitor has a fair chance to succeed, thereby boosting morale and encouraging continued engagement in sports.

- 100.** Define inclusion in sports and explain its significance for the overall development of children with special needs.

Ans :

DELHI 2015

1. **Definition:** Inclusion in sports refers to the integration of children with special needs into regular sports programs alongside their non-disabled peers, with appropriate modifications to accommodate their abilities.
2. **Significance:** This approach is vital because it not only improves physical fitness but also promotes social interaction, builds self-esteem, and teaches valuable life skills such as teamwork, perseverance, and mutual respect, all of which are essential for overall development.

- 101.** List two advantages of physical activities for children with special needs, providing examples for clarity.

Ans :

OD 2013

1. **Improved Motor Skills:** Regular practice of activities such as adapted yoga or modified team sports can enhance coordination, balance, and overall motor control, helping children perform daily tasks more effectively.
2. **Enhanced Emotional Well-being :** Participation in physical activities can reduce stress, increase endorphin levels, and boost self-confidence. For example, a child who regularly engages in swimming may experience greater calm and improved social

skills, and promoting inclusion through community-based events.

2. Paralympics:
 - i. Role : Organizes international competitions for athletes with physical impairments.
 - ii. Contribution: Showcases the abilities of athletes with disabilities, challenges stereotypes, and motivates children with special needs by providing role models and high-performance opportunities.
3. Deaflympics:
 - i. Role: Facilitates sports competitions for deaf and hard-of-hearing athletes.
 - ii. Contribution: Encourages communication, builds a sense of community, and highlights the unique skills of athletes, thereby promoting broader societal acceptance.

Together, these organizations provide a platform for athletic excellence, social integration, and empowerment for children with special needs.

- 112.** Explain the concept of classification and divisioning in sports for children with special needs. Why is it important and what factors are considered during classification?

Ans : SQP 2018

1. Concept of Classification and Divisioning:
 - i. Definition: Classification in sports involves grouping athletes based on the nature and extent of their disabilities, ensuring fair competition by matching athletes with similar functional abilities.
 - ii. Divisioning: Often used alongside classification, this organizes competitions into categories or divisions to ensure that athletes compete on an equitable basis.
2. Importance:
 - i. Fair Competition: Ensures that competitions are balanced and that no athlete is disadvantaged due to the severity or type of their disability.
 - ii. Enhanced Performance: Athletes compete against others with comparable abilities, which promotes a positive competitive environment and encourages personal improvement.
3. Factors Considered:
 - i. Type and Severity of Disability: Medical assessments and functional evaluations determine how an athlete's disability

impacts performance.

- ii. Sport-Specific Requirements: The physical demands of a particular sport influence classification criteria to ensure that performance differences are minimized.

- 113.** Discuss the concept of inclusion in sports for children with special needs. What is its importance, and what are some key strategies for effective implementation?

Ans : COMP 2003

1. Concept of Inclusion in Sports : Inclusion in sports involves integrating children with special needs into mainstream physical activities, competitions, and training environments.
2. Importance:
 - i. Equal Opportunities: Ensures that children with special needs have access to the same benefits of sports—physical fitness, social interaction, and emotional growth—as their peers.
 - ii. Social Integration : Promotes understanding, empathy, and diversity by breaking down barriers between athletes with and without disabilities.
3. Key Strategies for Implementation:
 - i. Adaptive Programs: Designing sports programs that modify rules, equipment, and environments to suit the needs of all participants.
 - ii. Awareness and Training: Educating coaches, teachers, and peers about disabilities to foster a supportive and inclusive atmosphere.
 - iii. Collaborative Partnerships: Working with organizations specializing in disability sports to develop inclusive policies and provide necessary resources.

- 114.** (a) What are two primary advantages of physical activities for children with special needs?
 (b) Explain how these benefits can impact their overall development.

Ans : DELHI 2006

1. Primary Advantages:
 - i. Physical Health: Regular physical activity improves cardiovascular health, muscular strength, and flexibility.
 - ii. Social and Emotional Well-Being: Participation in sports enhances self-esteem, reduces anxiety, and promotes

- 134.** “Participation in physical activities is advantageous for children with special needs.” Briefly explain any six advantages.

Ans :

2023

Children with special needs experience significant benefits from a well-planned exercise regimen. For example, consider the advantages in physical improvement:

1. **Physical Benefits:** Regular involvement in physical education and sport helps CWSN develop their gross and fine motor skills. This leads to tangible improvements in hand-eye coordination, flexibility, muscle strength, and cardiovascular efficiency, enhancing their overall physical health.
2. **Psychological Benefits:** Physical activity improves the general mood and wellness of CWSN by boosting their self-esteem, social awareness, and self-confidence. For children who may often feel isolated, developing a sense of accomplishment through sports is particularly important for their psychological well-being.
3. **Improved Social Skills:** Sports and group activities serve as a vital mode of recreation and fun, helping CWSN overcome social isolation. These settings provide them with the ability to engage in social interactions, make friends, and initiate and practice important social skills.
4. **Behavioural Benefits :** The structured nature of sports and games helps a child learn to practice self-regulation and enhances their decision-making abilities. They learn valuable skills like teamwork, problem-solving, increased attention span, and focus, which can then be transferred to other settings like the classroom.
5. **Increased Independence:** For a person with a disability, regular physical activity can lead to greater independence and freedom. The increased physical strength and energy that result from exercise allow individuals to perform more daily tasks on their own without assistance.
6. **Better Emotional Health:** Regular exercise is proven to improve mental health and can decrease rates of depression, to which CWSN are often more susceptible. The physical outlet provided by sports helps reduce anxiety and stress, leading to better emotional regulation and wellness.

- 135.** What are the types of disability? Explain briefly.

Ans :

SQP 2018

1. **Cognitive Disability:** The concept of cognitive disabilities is extremely broad and is not always precisely defined. In general terms, a person with a cognitive disability experiences greater difficulty with one or more types of mental tasks compared to the average individual. This term refers to intellectual disability, also known as general learning disability, and was previously known as mental retardation—a term now widely regarded as offensive. It is a generalized disorder characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors.
2. **Intellectual Disabilities:** These involve specific cognitive challenges that result in a lower intelligence quotient (IQ) score and significant difficulties in adapting to new situations, such as socializing. Individuals with intellectual disabilities have notable limitations in intellectual functions—such as reasoning, learning, and problem-solving—and in adaptive behaviors, including interacting with their peer group. They find it more challenging to understand and apply new information as it is presented. This group is often referred to as “mentally challenged.”
3. **Physical Disability:** A physical disability is defined as a limitation on a person’s physical functioning, which affects mobility, the use of hands for work, or the ability to sustain work over an extended period. Physical disabilities include impairments that restrict various facets of daily living, such as respiratory disorders, blindness, epilepsy, and sleep disorders. In other words, a physical disability is any type of physical condition that significantly impacts one or more essential life activities.

- 136.** How physical activities are helpful for children with special need? Explain strategies to make physical activities assessable for them.

Ans :

COMP 2020

Children with special needs gain significant advantages from well-planned physical activities and sports, such as basic gymnastics, provided they are conducted under the guidance of skilled instructors. These programs not only help improve muscle tone, control obesity, and promote an active lifestyle, but they also enhance a child’s self-image, social skills, and motivation. Ironically, the

- ii. Support: Creates opportunities for children with hearing challenges to develop skills, engage with peers, and build confidence in their abilities.

These organizations collectively enhance the visibility, resources, and opportunities available for children with special needs, paving the way for more inclusive and accessible sports environments.

- 118.** Explain the process and importance of classification and divisioning in disability sports. What impact does this have on competition fairness and athlete development?

Ans :

COMP 2012

1. Process :
 - i. Assessment: Athletes undergo medical and functional evaluations to determine the type and extent of their disability.
 - ii. Grouping: Based on these evaluations, athletes are grouped into classes or divisions that level the playing field for competition.
2. Importance:
 - i. Ensuring Fairness: By placing athletes with similar functional abilities in the same group, classification prevents mismatches and promotes equitable competition.
 - ii. Enhancing Development: Fair competition allows athletes to challenge themselves and progress in a supportive environment, thereby fostering long-term athletic and personal growth.

This system is essential for maintaining competitive integrity and ensuring that every athlete has the opportunity to perform to their fullest potential.

- 119.** Discuss the principles of inclusion in sports for children with special needs. What challenges might arise, and how can inclusive practices benefit both athletes with and without disabilities?

Ans :

DELHI 2011

1. Principles of Inclusion:
 - i. Equal Access: Ensuring that every child, regardless of ability, has the opportunity to participate in sports.
 - ii. Adaptability: Modifying rules, equipment, and environments to meet diverse needs.
 - iii. Respect and Support: Fostering an environment where differences are

celebrated and every participant is valued.

2. Challenges:
 - i. Resource Limitations: Lack of adaptive equipment and accessible facilities can hinder participation.
 - ii. Attitudinal Barriers: Misconceptions or lack of awareness about disability may lead to exclusionary practices.
3. Benefits:
 - i. For Children with Special Needs: Improved self-esteem, enhanced physical and cognitive skills, and a greater sense of belonging.
 - ii. For Peers Without Disabilities: Increased empathy, improved social skills, and exposure to diverse talents and perspectives.

Inclusive practices create a dynamic and supportive sporting environment that benefits all participants by promoting mutual respect and understanding.

- 120.** (a) What are two key advantages of physical activities for children with special needs?
 (b) How do these advantages contribute to their academic and social development?

Ans :

OD 2010

- (a) Key Advantages:
 - i. Improved Motor Skills and Coordination: Regular physical activity enhances balance, strength, and coordination.
 - ii. Enhanced Self-Confidence: Participation in sports can boost self-esteem and encourage a positive self-image.
- (b) Contribution to Development:
 - i. Academic Development: Improved coordination and concentration can lead to better classroom performance as physical activity supports brain function and learning.
 - ii. Social Development: Increased self-confidence and improved communication skills help children build friendships, engage in teamwork, and participate more actively in social settings.

These advantages create a well-rounded developmental experience, supporting both academic success and social integration.

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social interaction.

2. Impact on Overall Development:
 - i. Enhanced Physical Fitness: Improved physical health leads to greater independence in daily activities and reduces the risk of secondary health problems.
 - ii. Emotional Resilience and Social Skills: Engaging in team sports and structured physical activities builds confidence, fosters communication, and supports the development of cooperative and leadership skills, which are essential for overall growth and integration into society.

115. Illustrate with an example how adaptive strategies can be used to make physical activities accessible for children with special needs.

Ans :

OD 2007

Consider a school-based sports program that aims to include children with mobility impairments.

1. Adaptive Strategies Implemented :
 - i. Modified Equipment: For example, using lightweight, larger balls that are easier to catch or kick.
 - ii. Rule Adjustments: Altering game rules to allow for more time or different scoring methods, so that children with special needs can participate effectively.
 - iii. Environmental Modifications: Ensuring that playing surfaces are smooth and free of obstacles to prevent falls and injuries.
2. Example Outcome : In an adapted basketball session, children with mobility challenges use lower hoops and smaller courts. This modification allows them to engage in shooting and passing drills with ease, boosting their confidence and ensuring that they enjoy the physical and social benefits of the game alongside their peers.

116. (a) What are some common challenges faced when making physical activities accessible for children with special needs?

(b) Describe strategies that can overcome these challenges.

Ans :

FOREIGN 2008

- (a) Common Challenges:
 - i. Limited Infrastructure: Inadequate facilities and equipment that are not designed to accommodate diverse abilities.

- ii. Lack of Specialized Training: Coaches and educators may not have the expertise or resources to adapt programs effectively for children with special needs.

(b) Strategies to Overcome Challenges:

- i. Infrastructure Improvements : Accessible Facilities: Designing or retrofitting sports venues to include ramps, specialized equipment, and smooth surfaces to ensure safety and accessibility.
- ii. Adaptive Equipment: Investing in sports gear that caters specifically to the needs of children with disabilities.
- iii. Specialized Training Programs : Professional Development: Offering training and workshops for coaches and physical educators to learn about adaptive sports techniques and inclusive practices.
- iv. Collaborative Partnerships: Partnering with organizations experienced in disability sports to provide guidance and resources.

117. Describe the contributions of the Special Olympics, Paralympics, and Deaflympics in advancing disability sports. How do these organizations support children with special needs?

Ans :

SQP 2002

1. Special Olympics:
 - i. Contributions: Offers year-round training and competitions, focusing on building skills, self-esteem, and social interaction for children with intellectual disabilities.
 - ii. Support: Provides adaptive sports programs, community events, and educational initiatives to foster inclusion and personal development.
2. Paralympics :
 - i. Contributions: Promotes elite sports performance among athletes with physical disabilities through international competitions.
 - ii. Support: Serves as a platform for showcasing athletic excellence, inspiring children with special needs to pursue competitive sports, and advocating for better accessibility and resources.
3. Deaflympics:
 - i. Contributions: Organizes sports events for athletes with hearing impairments, emphasizing communication and teamwork.

Ans :

DELHI 2016

1. Role of Classification : Classification is pivotal in disability sports as it groups athletes based on similar functional abilities, ensuring fair competition.
2. Criteria Used:
 - i. Medical and Functional Assessments: Evaluations of the athlete's physical capabilities and the nature of their disability.
 - ii. Sport-Specific Demands: Consideration of how the disability affects performance in a particular sport, ensuring that the competitive environment is balanced.
3. Leveling the Playing Field:
 - i. Equitable Competition: Athletes compete against others with comparable abilities, which minimizes performance discrepancies that stem from differing degrees of disability.
 - ii. Enhanced Fairness: This system fosters an environment where success is determined by skill, training, and strategy rather than the severity of the impairment, thereby promoting a more inclusive and competitive atmosphere.

- 125.** How does the concept of inclusion in sports extend beyond simply allowing children with special needs to participate? Discuss its broader impact on educational and social systems.

Ans :

OD 2015

Inclusion in sports goes far beyond mere participation by:

1. Fostering Integrated Environments: It creates settings where children with and without disabilities interact, learn, and grow together, leading to improved empathy, mutual respect, and social cohesion.
2. Educational Impact: Inclusive sports programs support academic environments by enhancing students' self-esteem, reducing absenteeism, and encouraging teamwork—skills that are transferable to classroom learning.
3. Social Impact: These programs serve as a model for broader societal inclusion, breaking down barriers and encouraging communities to adopt policies and practices that benefit all members.

The ripple effect of inclusive sports is significant, promoting not only physical health but also shaping more inclusive, tolerant, and dynamic social and educational systems.

- 126.** (a) Identify two major benefits of physical activities for children with special needs.
- (b) How do these benefits contribute to their integration into mainstream society?

Ans :

FOREIGN 2014

- (a) Major Benefits :
- i. Physical Health Improvement: Regular activity improves strength, coordination, and overall fitness, which can reduce the risk of secondary health issues.
 - ii. Enhanced Social Skills: Participation in group activities fosters communication, teamwork, and confidence.
- (b) Contribution to Integration:
- i. Physical Capability: Better physical health enables children to participate more fully in both sports and everyday activities, reducing dependency and promoting independence.
 - ii. Social Interaction: Improved social skills and increased confidence help children form relationships, participate in community events, and interact effectively with peers, thereby easing their transition into mainstream society.

- 127.** Provide an example of a strategy that has been successfully implemented to increase accessibility in physical education for children with special needs. What were the key elements that ensured its success?

Ans :

SQP 2020

One successful strategy is the development of an adaptive physical education curriculum in a public school system.

Key Elements:

1. Individualized Education Plans (IEPs): Tailoring physical activities to match each child's abilities and needs, ensuring personalized progress and safety.
2. Adaptive Equipment: Integrating specialized equipment such as modified balls, balance aids, and adjustable play structures to make participation easier and more enjoyable.
3. Teacher Training: Professional development programs that equip physical education teachers with the skills needed to adapt activities, monitor progress, and foster an inclusive environment.

This strategy's success is rooted in its comprehensive approach, combining individualized instruction,

appropriate resources, and educator preparedness to create an accessible and supportive physical education program.

- 128.** (a) What are some challenges faced by schools and communities in making physical activities accessible for children with special needs?
- (b) Suggest practical measures that can be taken to address these challenges.

Ans :

COMP 2009

- (a) Challenges:
- i. Resource Constraints: Limited funding for adaptive equipment and accessible facility modifications.
 - ii. Lack of Awareness: Insufficient training and understanding among educators and coaches about the specific needs of children with disabilities.
- (b) Practical Measures:
- i. Funding Initiatives : Schools and communities can seek grants, sponsorships, and partnerships with disability sports organizations to secure necessary resources.
 - ii. Professional Development : Implement training sessions for educators and coaches to enhance their skills in adaptive physical education and inclusive teaching methodologies.
 - iii. Community Engagement : Involve parents, local businesses, and advocacy groups to create a network of support and raise awareness about the benefits of inclusive physical activities.

- 129.** Discuss the role of international disability sports organizations in shaping policies and practices for inclusive physical education. What influence do they have on local sports programs for children with special needs?

Ans :

DELHI 2001

International disability sports organizations, such as the Special Olympics, Paralympics, and Deaflympics, play a pivotal role by:

1. Setting Standards: They develop guidelines and best practices for inclusive physical education that can be adopted by local sports programs.
2. Advocacy and Policy Influence: Their global presence and advocacy work drive legislative and funding changes that prioritize accessibility and inclusion in sports.

3. Resource Sharing: They offer training modules, equipment recommendations, and networking opportunities that local programs can utilize to enhance their offerings.

These organizations significantly influence local sports programs by providing a framework for inclusivity, advocating for the rights of children with special needs, and offering resources that enable communities to implement effective, adaptive physical education programs.

- 130.** Explain the process of developing a classification system for sports participation among children with special needs. How does this system contribute to both fair competition and targeted training?

Ans :

OD 2017

1. Development Process:
 - i. Assessment : Begin with comprehensive medical and functional evaluations to understand each child's specific abilities and limitations.
 - ii. Grouping : Based on assessment data, athletes are grouped into classes that reflect similar levels of physical function.
 - iii. Ongoing Review: The classification system is periodically reviewed and updated to reflect improvements or changes in an athlete's condition.
2. Contributions:
 - i. Fair Competition : Athletes compete against others with comparable abilities, reducing disparities that could arise from different types and severities of disabilities.
 - ii. Targeted Training : Coaches can design training programs that address the specific needs of each classification group, ensuring that exercises are both safe and effective, thereby promoting skill development and performance improvements.

- 131.** Discuss the multifaceted benefits of inclusion in sports for children with special needs. How does this approach affect their physical, emotional, and social well-being?

Ans :

OD 2006

1. Physical Benefits:
 - i. Enhanced Fitness: Regular physical activity improves muscle strength, flexibility, and coordination, which are

- essential for overall health.
- ii. **Reduced Health Risks:** Inclusive sports help lower the risk of secondary health issues such as obesity and cardiovascular problems.
2. **Emotional Benefits:**
 - i. **Boosted Self-Esteem:** Participation in inclusive sports builds confidence and self-worth by providing opportunities for achievement and recognition.
 - ii. **Stress Reduction:** Physical activities help release endorphins that reduce anxiety and improve mood.
 3. **Social Benefits:**
 - i. **Improved Social Skills:** Interaction with peers in a diverse environment fosters communication, teamwork, and empathy.
 - ii. **Sense of Belonging:** Being part of an inclusive team or group helps children feel valued and connected, enhancing their overall quality of life.

Overall, inclusion in sports nurtures a holistic development for children with special needs, positively influencing their physical health, emotional stability, and social integration.

- 132.** (a) What are the key factors that must be considered when designing adaptive physical education programs for children with special needs?
- (b) How can these factors be effectively integrated into program planning?

Ans :

FOREIGN 2004

- (a) **Key Factors:**
 - i. **Individual Needs Assessment:** Understanding each child's abilities, limitations, and interests.
 - ii. **Resource Availability:** Ensuring access to adaptive equipment, trained staff, and accessible facilities.
- (b) **Effective Integration:**
 - i. **Customized Curriculum :** Develop programs that are flexible enough to cater to individual differences, incorporating various activities and adaptive methods.
 - ii. **Ongoing Evaluation:** Regularly assess program effectiveness and make necessary adjustments based on feedback from children, parents, and educators.
 - iii. **Collaboration:** Engage specialists in adaptive sports, occupational therapists,

and inclusive education experts to design and implement the program effectively. By addressing these factors during the planning stage, schools and community centers can create adaptive physical education programs that are both inclusive and highly effective in meeting the diverse needs of children with special needs.

FIVE MARKS QUESTIONS

- 133.** Explain cognitive disability along with its symptoms.

Ans :

Term-II, 2021-22

Cognitive Disability : This disorder is classified under mental disorders. Due to cognitive disability, an individual's ability to learn, speak, memorize, and solve problems is significantly impaired. As a result, the person may suffer from conditions such as dementia and delirium. Additionally, cognitive disability negatively impacts both memory and reasoning capabilities.

1. **Symptoms :**
 - i. **Memory Disorder:** The individual experiences difficulty with listening and then recalling information accurately.
 - ii. **Hyperactivity:** The individual tends to become excessively active during periods of sitting or standing, often appearing to be in an undue hurry.
 - iii. **Dyslexia:** The individual faces challenges with reading, writing, and memorizing, making these activities particularly strenuous.
2. **Causes of Cognitive Disability :** Cognitive disability typically occurs due to issues related to the brain. These may include the presence of a tumor, head injury, shock, infection, exposure to harmful neurotoxins, heredity, or other brain-related diseases. Such conditions affect a person's capacity to memorize, learn, and perform routine activities. For example, if a tumor or head injury impacts the region of the brain responsible for speech, the individual's ability to speak may be compromised. Similarly, if the affected area is responsible for controlling physical movement, it can hinder the person's motor skills and overall physical activity.

who are patient and responsive to the unique needs of children with special needs.

- 138.** How do organizations such as Special Olympics, Paralympics, and Deaflympics contribute to promoting sports among children with special needs, and what are some specific examples of their impact?

Ans :

OD 2002

1. Special Olympics:
 - i. Provides comprehensive, year-round training programs and competitive events tailored for children and adults with intellectual disabilities.
 - ii. Empowers participants by enhancing physical fitness, social skills, and self-confidence through structured sports activities.
 - iii. Encourages teamwork and goal-setting, fostering a sense of achievement and personal development.
 - iv. Promotes community awareness and inclusiveness by showcasing the athletic talents of individuals with intellectual challenges.
2. Paralympics:
 - i. Focuses on athletes with physical impairments, ensuring fair competition through a rigorous classification system.
 - ii. Offers high-caliber competitive events that improve both physical health and mental well-being.
 - iii. Raises public awareness of adaptive sports, challenging stereotypes and encouraging broader societal inclusion.
 - iv. Drives innovation in adaptive sports equipment and training methods, enhancing overall athlete performance.
3. Deaflympics:
 - i. Specifically caters to athletes with hearing impairments by adapting communication methods and competition rules.
 - ii. Fosters a supportive environment where deaf athletes can thrive and develop their athletic skills.
 - iii. Enhances community engagement and peer interaction through specialized sports events.
 - iv. Serves as a model for accessibility in sports, encouraging other organizations to adapt programs for diverse needs.

- 139.** What is the significance of classification and divisioning in disability sports, and how do these processes ensure fair competition among children with special needs?

Ans :

FOREIGN 2010

1. Purpose of Classification:
 - i. Groups athletes based on the type and severity of their disabilities to create a level playing field.
 - ii. Ensures that children with similar physical or cognitive challenges compete against one another, promoting fairness.
 - iii. Facilitates a structured approach to competition, allowing for balanced and equitable match-ups.
2. Divisioning in Sports:
 - i. Further refines groupings by categorizing athletes into more specific divisions according to their abilities.
 - ii. Enhances safety by reducing the risk of injury that might occur if athletes with significant ability disparities compete together.
 - iii. Provides tailored competition settings that address the unique requirements of different disability categories.
3. Benefits for Athletes:
 - i. Boosts confidence and motivation, as athletes compete within a context that values their abilities.
 - ii. Encourages targeted training programs and coaching, with instructors adapting strategies to suit each classification.
 - iii. Drives innovation in adaptive equipment and methodologies that improve overall performance.
4. Broader Impact:
 - i. Promotes a fair and competitive atmosphere, which is essential for the growth and recognition of disability sports.
 - ii. Enhances public perception and respect for athletes by showcasing their skills in an equitable competitive framework.
 - iii. Lays the groundwork for increased participation and more inclusive sports events across various levels.

- 140.** How does the concept of inclusion in sports benefit children with special needs, and what effective strategies can be implemented in educational settings to promote inclusive physical activities?

students who could benefit most from physical education often participate the least.

1. **Medical Check-up:** Although disabilities may not be diagnosed during routine school medical examinations, early signs of certain problems can often be detected, allowing parents to be alerted. For instance, children showing signs of obesity can be identified and placed in groups for appropriate physical activities.
2. **Sensory Integration:** Many disabilities are aggravated by environmental factors; bright lights (even sunlight) and loud music can become irritants, particularly when neurological differences are involved. Even the squeaking noise of rubber-soled shoes may cause issues. Therefore, it is essential that the physical activity environment be suitably adapted to meet the needs of disabled participants.
3. **Behaviour and Instructions:** Instructors should not expect immediate responses and may need to repeat instructions several times. Employing 'Positive Behaviour Interventions' such as "Prevent, Teach, Reinforce" is crucial. In addition to verbal instructions, written cues on notice boards may also be necessary to ensure clear communication.
4. **Designed as per Needs:** Teachers and parents must remain sensitive to the individual needs, requirements, and preferences of each child. It is important to consider a child's previous experiences and existing knowledge when planning physical activities. By taking these factors into account, activities can be tailored to maximize benefit and participation for every child.

137. Discuss the significance of organizations that promote disability sports, such as Special Olympics, Paralympics, and Deaflympics, along with the concepts of classification and inclusion in sports. In your response, explain the benefits of physical activities for children with special needs and propose strategies to ensure these activities are accessible.

Ans :

DELHI 2017

1. **Role of Organizations Promoting Disability Sports:**
 - i. **Special Olympics:** Provides year-round sports training and competitive events for children and adults with intellectual disabilities. This helps participants

develop physical fitness, courage, and social skills.

- ii. **Paralympics:** Focuses on athletes with physical impairments. It ensures fair competition through the systematic process of classification, grouping athletes by the extent of their disabilities.
 - iii. **Deaflympics:** Empowers deaf athletes by offering sports events and competitions tailored to their communication needs and abilities.
2. **Concepts of Classification and Inclusion in Sports:**
 - i. **Classification:** Involves dividing athletes into groups based on the severity of their disability. This ensures a level playing field and fair competition across different disability categories.
 - ii. **Inclusion:** Integrates children with special needs into mainstream sports activities. This approach not only fosters social interaction but also promotes equality and acceptance in educational and sporting environments.
 3. **Advantages of Physical Activities for Children with Special Needs:**
 - i. Enhances physical fitness, muscle tone, and coordination.
 - ii. Boosts self-esteem, confidence, and positive self-image.
 - iii. Reduces anxiety, stress, and the risk of health complications.
 - iv. Improves social skills and encourages interaction with peers.
 - v. Contributes to cognitive and emotional development.
 4. **Strategies to Make Physical Activities Accessible:**
 - i. **Medical Check-ups:** Conduct regular assessments to tailor activities to the individual needs of children.
 - ii. **Sensory-Friendly Environments:** Create spaces that minimize distractions like loud noises and harsh lighting, ensuring accessibility for all.
 - iii. **Adaptive Equipment:** Provide appropriate sports gear and modify equipment to suit different ability levels.
 - iv. **Diverse Communication Methods:** Use verbal, visual, and written instructions to ensure clear understanding.
 - v. **Trained Instructors:** Employ professionals skilled in positive behavior interventions

- 121.** Provide an example of a successful program or strategy that has been implemented to make physical activities accessible for children with special needs. What were the key components of this strategy?

Ans :

FOREIGN 2015

An example of a successful program is an adaptive sports initiative at a local community center that offers modified physical education classes.

Key Components Include:

1. **Customized Equipment:** Provision of adaptive gear such as lightweight balls, ramps, and sensory-friendly mats to accommodate various abilities.
2. **Tailored Curriculum:** A curriculum designed to incorporate both group and individual activities that can be adjusted based on each child's needs.
3. **Specialist Training:** Instructors receive training on adaptive techniques and inclusive teaching methods to better support children with special needs.
4. **Parental and Community Involvement:** Regular workshops and feedback sessions with parents and community stakeholders to continuously improve the program.

The program's success lies in its holistic approach, addressing both physical and emotional needs and ensuring that every child can participate safely and enjoyably.

- 122.** (a) What are some of the common obstacles to implementing inclusive physical education programs for children with special needs?
- (b) Suggest strategies to overcome these obstacles and enhance accessibility.

Ans :

SQP 2013

- (a) **Common Obstacles:**
- i. **Limited Funding and Resources:** Schools or organizations may lack the financial means to invest in adaptive equipment and facility modifications.
 - ii. **Insufficient Training:** Educators and coaches might not have adequate training in adaptive sports or inclusive teaching methods.
- (b) **Strategies to Overcome Obstacles:**
- i. **Securing Grants and Partnerships:** Apply for government grants or partner with local and national organizations dedicated to disability sports to obtain

necessary funds and resources.

- ii. **Professional Development Programs:** Implement continuous training workshops for educators and coaches, focusing on adaptive techniques and inclusive practices.
 - iii. **Community Engagement :** Involve parents, local businesses, and community leaders to build a supportive network that champions and funds inclusive initiatives.
- These strategies help create a more accessible, resource-rich environment that can accommodate and celebrate the abilities of every child.

- 123.** Explain how organizations like the Special Olympics, Paralympics, and Deaflympics serve as catalysts for change in the realm of disability sports. What long-term impacts do they have on the community and on individual athletes?

Ans :

COMP 2019

1. Organizations such as the Special Olympics, Paralympics, and Deaflympics are catalysts for change by:
 - i. **Raising Awareness:** They highlight the athletic capabilities of individuals with disabilities, challenging stereotypes and encouraging society to view disability through a lens of ability rather than limitation.
 - ii. **Providing Opportunities:** By organizing competitions and training programs, they offer children with special needs opportunities to develop skills, gain recognition, and build confidence.
2. **Long-Term Impacts:**
 - i. **Community Impact:** These organizations promote inclusive communities where diversity is celebrated, leading to improved access to sports facilities and resources for people with disabilities.
 - ii. **Individual Impact:** Athletes experience enhanced self-esteem, better health outcomes, and the inspiration to achieve beyond what was previously thought possible, paving the way for future generations.

- 124.** Discuss the role of classification in creating equitable competition in disability sports. What criteria are used for classification, and how do they help level the playing field?

Ans :

SQP 2016

1. Benefits of Inclusion:
 - i. Fosters a sense of belonging by integrating children with and without special needs into the same activities.
 - ii. Enhances social skills through interaction, teamwork, and cooperative learning, thereby reducing social isolation.
 - iii. Boosts self-esteem and confidence as children with special needs experience acceptance and learn to value their unique contributions.
 - iv. Encourages mutual respect and understanding among all participants, promoting a more empathetic and inclusive community.
2. Strategies for Implementation:
 - i. Curriculum Adaptation: Modify physical education programs to suit various ability levels by incorporating adaptive games and activities.
 - ii. Environmental Adjustments: Ensure physical spaces are accessible and free from sensory distractions, such as excessive noise or harsh lighting.
 - iii. Instructional Diversity: Use a combination of verbal, visual, and written instructions to cater to different learning styles and ensure clarity.
 - iv. Teacher Training: Equip educators and coaches with the skills necessary for differentiated instruction and positive behavior interventions.
 - v. Advance Communication: Provide clear, timely information about activities, including any changes or special requirements.
 - vi. Collaborative Planning: Involve parents and children in the planning process to ensure that programs reflect their needs and preferences.
3. Long-Term Impact:
 - i. Cultivates lifelong habits of physical activity, contributing to overall physical and mental well-being.
 - ii. Creates a supportive educational environment that positively influences academic performance and social development.
 - iii. Fosters a community culture where diversity is celebrated and every child feels valued.

- 141.** Discuss the advantages of physical activities for children with special needs and outline comprehensive strategies to make these activities both accessible and beneficial.

Ans :

COMP 2018

1. Advantages of Physical Activities:
 - i. Physical Health Improvement: Enhances muscle tone, coordination, and overall fitness; reduces risks of obesity and other health issues.
 - ii. Cognitive Benefits: Boosts concentration and problem-solving skills while encouraging discipline and structured routines.
 - iii. Emotional Well-Being: Helps lower stress, anxiety, and depression; promotes a positive mental state and self-image.
 - iv. Social Interaction: Encourages teamwork and communication, thereby enhancing social skills and building meaningful peer relationships.
 - v. Self-Confidence: Provides opportunities for achievement, fostering self-esteem and a sense of accomplishment.
 - vi. Holistic Development: Supports overall development by integrating physical, cognitive, and emotional growth.
2. Strategies to Enhance Accessibility:
 - i. Regular Medical Check-ups: Ensure individualized assessments to tailor activities to the specific needs and capabilities of each child.
 - ii. Sensory-Friendly Environments: Create spaces that are designed to minimize sensory overload by controlling factors like noise, lighting, and temperature.
 - iii. Adaptive Equipment: Invest in specialized sports equipment that accommodates different disabilities, ensuring safe participation.
 - iv. Trained Instructors: Employ professionals skilled in adaptive physical education and positive behavior interventions to guide and support participants.
 - v. Clear Communication: Provide advance details about activities, including venue specifics, schedules, and any changes, using multiple formats (verbal, visual, written).
 - vi. Inclusive Planning: Collaborate with

Ans :

- (a) Spirit in motion

147. In reference to the picture answer the following questions :



DEAFLYMPICS

- (i) The Deaflympics were first held in:
 (a) 1924 (Paris)
 (b) 1948 (London)
 (c) 1960 (Rome)
 (d) 1985 (Los Angeles)

Ans :

- (a) 1924 (Paris)
 (ii) The Deaflympics are recognized by:
 (a) International Committee of the Red Cross
 (b) International Paralympic Committee
 (c) International Olympic Committee
 (d) United Nations

Ans :

- (c) International Olympic Committee
 (iii) Which of the following is most associated with Deaflympics events?
 (a) Audio announcements for athletes
 (b) Visual cues and sign language
 (c) Wheelchair-accessible courts
 (d) Special hearing aids for competitors

Ans :

- (b) Visual cues and sign language
 (iv) The motto of the Deaflympics is:
 (a) "Faster, Higher, Stronger"
 (b) "Equality Through Sports"
 (c) "Per Ludos Aequalitas"
 (d) "Spirit in Motion"

Ans :

- (c) "Per Ludos Aequalitas"

148. In reference to the picture answer the following questions :



SPECIALOLYMPICS

- (i) The Special Olympics were founded by:
 (a) Ludwig Guttman
 (b) Eunice Kennedy Shriver
 (c) Pierre de Coubertin
 (d) Juan Antonio Samaranch

Ans :

- (b) Eunice Kennedy Shriver
 (ii) The first official Special Olympics Games took place in:
 (a) 1968 in Chicago
 (b) 1976 in Toronto
 (c) 1988 in Seoul
 (d) 1992 in Barcelona

Ans :

- (a) 1968 in Chicago
 (iii) The motto of the Special Olympics is:
 (a) "Let me win. But if I cannot win, let me be brave in the attempt."
 (b) "Faster, Higher, Stronger"
 (c) "Spirit in Motion"
 (d) "Per Ludos Aequalitas"

Ans :

- (a) "Let me win. But if I cannot win, let me be brave in the attempt."
 (iv) The primary goal of the Special Olympics is:
 (a) Elite competition for professional athletes
 (b) Inclusive sports training and athletic competition for individuals with intellectual disabilities
 (c) Charity fundraising for general medical research
 (d) Restricting sports only to wheelchair users

Ans :

- 144.** In relation to the pictures, answer the following questions.

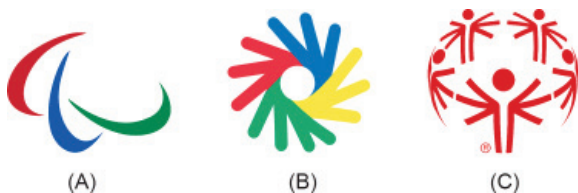


- What is the mission of the first organisation?
- What is the motto of the first organisation?
- Until 1965 the games in the second picture were known as _____.
- Second pictures games are conducted after every _____ years.

Ans :

- The mission of Special Olympics is to offer year-round sports training and competitive events in a range of Olympic-style sports for children and adults with intellectual disabilities. This initiative provides ongoing opportunities to enhance physical fitness, showcase bravery, experience joy, and actively participate in various events.
- "Let me win. But if I cannot win, let me be brave in the attempt."
- International Games for the Deaf International Silent Games"
- 4

- 145.** In relation to the pictures, answer the following questions:

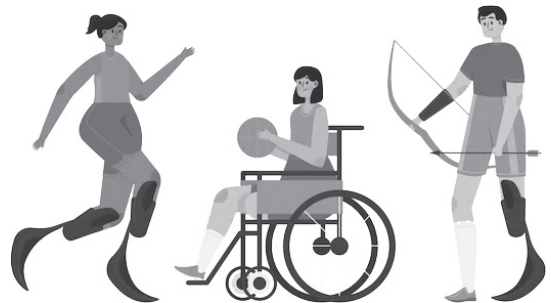


- Logo shown in picture _____ refers to Special Olympic.
- Who was the founder of Special Olympics?
- According to figure 'B', the hand shapes of 'OK', 'Good' and 'Great' that overlap each other in a circle, represent the original sign for _____.
- How many countries participated in the first Paralympic Games in Rome (Italy) in 1960?

Ans :

- C
- Eunice Kennedy Shriver
- Deaflympics
- 23

- 146.** In reference to the picture answer the following questions :



- The first Paralympics was organised in
 (a) 1960 (b) 1970
 (c) 1965 (d) 1985

Ans :

- 1960
- Special Education is a branch of education that deals with
 (a) Educating children in special schools
 (b) Instructions designed for students with special needs
 (c) To provide opportunity of special education
 (d) None of the above

Ans :

- Instructions designed for students with special needs
- Why is it called the Paralympics?
 (a) The first competition was held in Paraguay
 (b) It was originally for paramilitary soldiers injured in WW2
 (c) The event runs parallel with the Olympics
 (d) It's an event for paraplegics

Ans :

- The event runs parallel with the Olympics
- What is the motto of the Paralympic Games?
 (a) Spirit in motion
 (b) Citius, Altius, Fortius
 (c) "Faster, Higher, Stronger"
 (d) Diversity, Equality, Inclusion

Sources: Whole grains, fruits, vegetables, legumes, and nuts.

(ii) Water

Function: Vital for hydration, temperature regulation, and the transportation of nutrients and waste products in the body.

Importance: Maintaining proper hydration is essential for virtually all bodily functions.

(iii) Phytochemicals and Antioxidants

Function: Naturally occurring compounds in plants that may reduce inflammation, protect against cell damage, and decrease the risk of chronic diseases.

Examples: Flavonoids in berries, lycopene in tomatoes, and polyphenols in green tea.

Health Benefits: These compounds contribute to long-term health by combating oxidative stress and inflammation.

Impact on Health: Although non-nutritive, these components are crucial for digestive health, chronic disease prevention, and overall well-being.

4. EATING FOR WEIGHT CONTROL

4.1 Understanding Energy Balance and Healthy Weight

1. Energy Balance Principle: The equilibrium between calories consumed (through food and drink) and calories expended (through basal metabolism, physical activity, and digestion).
2. Healthy Weight: Achieved by consuming a nutrient-dense diet that provides sufficient energy for daily activities without promoting excessive weight gain.

4.2 Strategies for Weight Management

1. Nutrient Density: Focusing on foods that are rich in essential nutrients but relatively low in calories. This includes fruits, vegetables, whole grains, lean proteins, and healthy fats.
2. Portion Control: Implementing strategies like mindful eating, using smaller plates, and understanding serving sizes to manage calorie intake.
3. Balanced Meal Composition: Structuring meals with a proper ratio of carbohydrates, proteins, and fats to maintain satiety and stable energy levels throughout the day.

4.3 Common Pitfalls and Dieting Challenges

1. Extreme Dieting and Fad Diets:
 - (i) Risks: Overly restrictive diets can lead to nutritional deficiencies, muscle loss, metabolic slowdown, and rebound weight gain.
 - (ii) Short-Term vs. Long-Term: Temporary solutions often fail to create sustainable habits, leading to weight cycling.

Psychological Factors: Emotional eating, stress, and unrealistic expectations can undermine weight control efforts.
2. Myths and Misinformation: Addressing and debunking common misconceptions (e.g., “carbs are bad,” “all fats cause weight gain”) is critical for making informed decisions.

4.4 Managing Food Intolerances and Sensitivities

1. Identification: Recognizing symptoms of food intolerance or sensitivity (such as lactose or gluten intolerance) and adapting dietary choices accordingly.
2. Customization: Creating personalized meal plans that accommodate individual digestive needs while maintaining nutritional adequacy.

5. IMPORTANCE OF DIET IN SPORTS

5.1 Nutritional Demands of Athletic Performance

1. Role of Diet: Diet plays an integral role in preparing athletes for performance, sustaining energy during competition, and aiding in post-event recovery.
2. Individualization: Nutritional needs vary based on the type of sport, intensity, duration of activity, and individual metabolism.

5.2 Pre-Competition Nutrition

1. Energy Storage:
 - (i) Carbohydrate Loading: Increases muscle glycogen stores to provide a readily available energy source during prolonged or high-intensity activities.
 - (ii) Meal Timing: Consuming a balanced meal 2–3 hours before an event to optimize energy levels and reduce the risk of gastrointestinal discomfort.
2. Hydration Strategies: Ensuring proper hydration leading up to competition to enhance performance and prevent dehydration.

(b) Inclusive sports training and athletic competition for individuals with intellectual disabilities

149. In reference to the picture answer the following questions :



PARALYMPICS

- (i) The Paralympics primarily serve athletes with:
- Intellectual disabilities only
 - Physical, sensory, or intellectual impairments
 - No impairments
 - Only hearing impairments

Ans :

- (b) Physical, sensory, or intellectual impairments
- (ii) The first official Paralympic Games took place in:
- 1924 (Paris)
 - 1948 (London)
 - 1960 (Rome)
 - 1984 (Los Angeles)

Ans :

- (c) 1960 (Rome)
- (iii) Which organization is responsible for organizing the Paralympic Games?
- International Olympic Committee (IOC)
 - International Paralympic Committee (IPC)
 - Special Olympics International
 - Deaflympics Committee

Ans :

- (b) International Paralympic Committee (IPC)
- (iv) The motto of the Paralympics is:
- "Spirit in Motion"
 - "Faster, Higher, Stronger"
 - "Let me win. But if I cannot win, let me be brave in the attempt."
 - "Per Ludos Aequalitas"

Ans :

- (a) "Spirit in Motion"

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NODIA

4. Role of water in human body is to _____.

- (a) Regulate body temperature
- (b) Give energy
- (c) Repair cell
- (d) Protect from disease.

Ans :

2023

- (a) Regulate body temperature

Ans :

- (a) Regulate body temperature

Water plays a critical role in regulating body temperature by dissipating heat through sweating and evaporation. It also acts as a solvent for nutrients, supports metabolic reactions, and helps maintain overall cellular homeostasis.

5. Which of the following are water soluble vitamins?

- (a) Vitamin D & K
- (b) Vitamin B & C
- (c) Vitamin A & E
- (d) Vitamin A & C

Ans :

2023

- (b) Vitamin B & C

Vitamins B and C are water-soluble, meaning they dissolve in water and are not stored in the body. They are essential for energy metabolism, immune function, and antioxidant protection, and require regular replenishment via the diet.

6. Carrot and orange come under-

- (a) energy giving foods
- (b) body building foods
- (c) protective or regulatory foods
- (d) Normal foods

Ans :

Term-I, 2021-22

- (c) protective or regulatory foods

Carrots and oranges are rich in vitamins, antioxidants, and phytochemicals that protect cells from oxidative damage and help regulate bodily functions. Their nutrient profile supports vision, immune response, and overall health, classifying them as protective foods.

7. Which vitamins were consumed the most during Covid?

- (a) Vitamin C and D
- (b) Vitamin B and C
- (c) Vitamin A and B
- (d) Vitamin B and D

Ans :

Term-I, 2021-22

- (b) Vitamin B and C

During the COVID period, increased focus on immune support led to higher consumption of Vitamin B (for energy and stress management) and Vitamin C (a key antioxidant). These vitamins help maintain health during infections and overall stress.

8. _____ helps in smooth elimination of stool or faeces.

- (a) Lordosis
- (b) Roughage
- (c) Minerals
- (d) Vitamins

Ans :

Term-I, 2021-22

- (b) Roughage

Roughage, or dietary fiber, adds bulk to the stool and retains water, making it easier to pass through the digestive tract. This promotes regular bowel movements and prevents constipation, supporting overall gastrointestinal health.

9. Match the following vitamins with their functions:

	Vitamins		Functions
1.	Vitamin K	i	Need for blood clotting
2.	Vitamin D	ii	For protection of cell wall
3.	Vitamin E	iii	For vision in dim light
4.	Vitamin A	iv.	For absorption of calcium and phosphorus

Select the correct answer:

- | | | | | |
|-----|----|----|-----|-----|
| | 1 | 2 | 3 | 4 |
| (a) | i | iv | iii | ii |
| (b) | i | ii | iii | iv |
| (c) | ii | iv | iii | i |
| (d) | i | iv | ii | iii |

Ans :

Term-I, 2021-22

- (d) 1-(i), 2-(iv), 3-(ii), 4-(iii)

The matching is as follows: Vitamin K is needed for blood clotting (i); Vitamin D aids in the absorption of calcium and phosphorus (iv); Vitamin E protects cell membranes (ii); Vitamin A is crucial for vision, particularly in dim light (iii).

10. Following are energy giving food except-

- (a) Cereals
- (b) Sugar and Jaggery
- (c) Fats and Oil
- (d) Yellow and orange fruits

certain grains.

- (iv) **Quality Considerations:** Combining plant-based proteins to ensure all essential amino acids are consumed.

3. Fats

- (i) **Primary Role:** A concentrated energy source that also supports cell structure, insulation, and the absorption of fat-soluble vitamins (A, D, E, K).
- (ii) **Types of Fats:**
Saturated Fats: Typically found in animal products and some tropical oils; recommended in moderation.
Unsaturated Fats: Found in nuts, seeds, avocados, and oily fish; beneficial for heart health.
Trans Fats: Often artificially produced; should be avoided due to negative health effects.
- (iii) **Food Sources:** Vegetable oils, avocados, nuts, seeds, fatty fish, and dairy products.
- (iv) **Health Impact:** Emphasizing unsaturated fats supports cardiovascular health, while moderation with saturated fats is key.

2.2 Micronutrients

1. Vitamins

- (i) **Overview:** Organic compounds that are vital for various metabolic processes, acting as antioxidants, coenzymes, and regulators of cell and tissue functions.
- (ii) **Key Vitamins and Their Roles:**
Vitamin A: Essential for vision, skin health, and immune function.
Vitamin C: Supports the immune system, skin integrity, and acts as an antioxidant.
Vitamin D: Crucial for bone health and calcium absorption.
Vitamin E: Functions as an antioxidant protecting cell membranes.
- (iii) **Food Sources:** Citrus fruits, berries, leafy greens, dairy products, fortified cereals, and eggs.

2. Minerals

- (i) **Overview:** Inorganic elements that contribute to structural functions, electrolyte balance, and metabolic reactions.
- (ii) **Key Minerals and Their Roles:**
Calcium: Vital for bone and dental health, muscle function, and nerve signaling.
Iron: Critical for oxygen transport in the blood and energy metabolism.

Magnesium: Supports enzyme function, muscle and nerve transmission, and bone integrity.

- (iii) **Zinc :** Important for immune function, wound healing, and protein synthesis.
- (iv) **Food Sources :** Dairy products, leafy greens, nuts, meats, whole grains, and seafood.
- (v) **Absorption Considerations :** Some minerals require specific conditions or complementary nutrients for optimal absorption (e.g., vitamin C enhances iron absorption).

3. The Synergy of Nutrients in Daily Diet

- (i) **Balanced Integration :** Combining macronutrients and micronutrients in every meal supports optimal bodily functions, from energy metabolism to cellular repair.
- (ii) **Interactions:** Certain nutrients enhance the absorption of others—for instance, fats are necessary for the absorption of fat-soluble vitamins.
- (iii) **Diet Diversity:** A diverse diet ensures that no single nutrient is overlooked, contributing to overall nutritional adequacy.

3. NUTRITIVE & NON-NUTRITIVE COMPONENTS OF DIET

3.1 Nutritive Components

1. **Definition:** Substances in foods that provide energy (calories) and the necessary building blocks for growth, repair, and bodily functions.
2. **Examples:** Proteins, carbohydrates, fats, vitamins, and minerals.
3. **Functional Role:** They are directly used in metabolic processes, contribute to cellular structure, and are critical for physical and cognitive development.

3.2 Non-Nutritive Components

1. **Definition:** Components that, while not providing energy, play essential roles in maintaining health and preventing disease.
2. **Key Non-Nutritive Elements:**
 - (i) **Dietary Fiber**
Function: Aids in digestion, regulates bowel movements, helps control blood sugar levels, and lowers cholesterol.

parents, educators, and the children themselves to design activities that meet diverse needs and promote active engagement.

CASE BASED QUESTION

- 142.** School management needs to recognise the essential place of physical activity in the education of children with special needs. In order to develop lifelong habits for fitness and to provide them with many opportunities of socialisation, schools need to understand that physical education is not a secondary subject but it is just as important as other skills.



On the basis of above given picture answer the following questions:

- Development of Gross Motor and Fine Motor skills are benefits which are part of _____.
- Graded activities as strategy for effective inclusive physical education program includes _____.
- _____ for activities should be disturbance free (noise, heat, cold, texture of floor, audience etc.).
- The activities that include running, jumping, hopping, galloping, rolling, leaping and dodging, horizontal jump, slide _____.

Ans :

- Physical Benefits
- Simple to Complex
- Space
- Locomotor Activity

- 143.** A survey in an inclusive school setup found the discrepancies between the participation of normal and special child during annual sports meet. Study the table given below carefully

S.No.	Event	Normal Child(150)	Special Child (10)
1.	100 Mtr.	40	5
2.	400 Mtr.	25	2
3.	Long Jump	20	0
4.	High Jump	15	1
5.	Relay Race	8	4

Based on the above study and your knowledge, answer the following questions :

- As per the above table, in _____ event, there is no participation of Special Child.
 - Participation of students with disabilities in regular physical education classes is known as _____.
 - Enlist any two strategies to make physical activities accessible for children with special needs.
 - Motto of Special Olympic is _____.
- or
- The motto of Paralympic is _____.

Ans :

- long jump
- Inclusion
- Strategies to Make Physical Activities Accessible for CWSN:
 - Advance details regarding the activity, including the venue, resource person, or any modifications, must be communicated clearly.
 - For children with special needs, the space should be accessible to those with physical disabilities, and the activity area should be well-defined and contained.
- “Let me win. But if I cannot win, let me be brave in the attempt”.

or

- “To enable Para athletes to achieve sporting excellence and inspire and excite the world.”

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5.3 Nutrition During Competition

1. Sustaining Energy:
 - (i) Quick-Digesting Carbohydrates : Foods and beverages such as sports drinks, energy gels, or fruit provide immediate energy to combat fatigue during extended performance.
 - (ii) Electrolyte Balance: Replenishing sodium, potassium, and other key electrolytes lost through sweat to maintain muscle function and prevent cramps.
2. Practical Consumption: Strategies include scheduled fluid breaks and the use of portable, easily digestible snacks that do not disrupt performance.

5.4 Post-Competition Recovery Nutrition

1. Restoration and Repair:
 - (i) Carbohydrates : Replenish depleted glycogen stores, critical for muscle recovery.
 - (ii) Proteins : Essential for repairing muscle tissues damaged during exertion and stimulating muscle protein synthesis.
2. Hydration and Electrolyte Replenishment: Rehydrating effectively and restoring electrolyte balance to support rapid recovery.
3. Anti-Inflammatory Nutrients: Incorporating foods rich in antioxidants (such as berries and leafy greens) to reduce inflammation and accelerate recovery processes.
4. Long-Term Adaptations : A systematic recovery strategy not only minimizes post-competition soreness but also enhances overall training adaptations and readiness for future events.

5.5 Overall Impact on Athletic Performance

1. Performance Optimization: A tailored nutrition plan can improve endurance, strength, agility, and overall performance by ensuring that the body has the necessary resources before, during, and after competition.
2. Injury Prevention and Recovery: Adequate nutrition supports immune function and tissue repair, reducing the risk of injuries and aiding in faster recovery when injuries do occur.
3. Psychological Edge: Well-nourished athletes often experience improved focus, better mood regulation, and increased confidence—factors that contribute to competitive success.

MULTIPLE CHOICE QUESTION

1. Balanced diet is related to-
 - (a) Consuming right amount of vitamins
 - (b) Consuming correct ratio of carbohydrates and fats
 - (c) Consuming all the nutrients in right amount
 - (d) Consuming excess of protein and minerals

Ans :

Term-I, 2021-22

(c) Consuming all the nutrients in right amount
A balanced diet ensures that all essential nutrients—including macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals)—are consumed in proper proportions. This complete nutrient profile supports optimal body function, growth, and disease prevention.

2. During the morning assembly in the school, Anu fell unconscious. She was taken to nearby doctor. The doctor declared her malnourished and advised her to take balanced diet everyday. Balanced diet consists:
 - (a) Macro Nutrients
 - (b) Micro Nutrients
 - (c) Nutritive and Non-Nutritive components
 - (d) Nutritive component.

Ans :

Term-I, 2021-22

(c) Nutritive and Non-Nutritive components
A balanced diet comprises both nutritive components (which provide energy and essential nutrients) and non-nutritive components (such as fiber and water, which aid digestion and overall health). Together, they work to maintain bodily functions and prevent malnutrition.

3. Which of the following is a group of macro-nutrients?
 - (a) Carbohydrates, Fats, Protein
 - (b) Vitamins, Minerals, Water
 - (c) Fats, Fibre, Protein
 - (d) Minerals, Carbohydrates, Vitamins

Ans :

2021 C

(a) Carbohydrates, Fats, Protein
Macro-nutrients are required in large amounts and include carbohydrates, fats, and proteins. These provide energy, serve as building blocks for tissues, and support metabolic processes, making them vital for growth and daily activities.

CHAPTER 5

SPORTS AND NUTRITION

SUMMARY

1. CONCEPT OF BALANCED DIET AND NUTRITION

1.1 Definition and Fundamentals

1. **Balanced Diet:** A balanced diet involves consuming a diverse range of foods in correct proportions to supply the body with all essential nutrients. This ensures that energy, growth, and maintenance needs are met, supporting overall bodily functions.
2. **Nutrition:** The study of nutrients in food, how the body uses them, and the relationship between diet, health and disease.

1.2 Core Principles of a Balanced Diet

1. **Variety:** Incorporating foods from different food groups (fruits, vegetables, grains, proteins, and dairy or alternatives) to ensure a wide spectrum of nutrients.
2. **Proportionality:** Consuming each food group in the right amounts to meet energy needs without excessive intake of any one nutrient.
3. **Moderation:** Balancing portions to avoid overconsumption, particularly of fats, sugars, and sodium.

1.3 Benefits and Health Implications

1. **Overall Health and Well-Being:** Provides the building blocks for growth, tissue repair, immune function, and mental well-being.
2. **Disease Prevention:** A balanced diet can reduce the risk of chronic illnesses such as obesity, type 2 diabetes, cardiovascular diseases, and certain cancers.
3. **Energy Regulation:** Helps maintain stable blood sugar levels and provides consistent energy throughout the day.

1.4 Practical Strategies for Implementation

1. **Meal Planning:** Creating menus that include a mix of macronutrients and micronutrients, ensuring seasonal fruits and vegetables are incorporated.
2. **Portion Control:** Using visual guides (like the plate method) to manage serving sizes and ensure nutrient-dense meals.
3. **Nutritional Literacy:** Learning to read food labels, understand portion sizes, and recognize nutrient-dense versus empty-calorie foods.

2. MACRO AND MICRO NUTRIENTS: FOOD SOURCES & FUNCTIONS

2.1 Macronutrients

1. **Carbohydrates**
 - (i) **Primary Role:** The body's main source of energy, fueling activities from basic bodily functions to high-intensity exercise.
 - (ii) **Types:**
 - Simple Carbohydrates:** Found in fruits and dairy, provide quick energy.
 - Complex Carbohydrates:** Present in whole grains, legumes, and starchy vegetables, offer sustained energy release.
 - (iii) **Food Sources:** Grains (rice, wheat, oats), fruits, vegetables, legumes.
 - (iv) **Additional Considerations :** Emphasis on choosing whole grains and unrefined carbohydrates to maximize fiber and nutrient intake.
2. **Proteins**
 - (i) **Primary Role:** Essential for the repair, maintenance, and building of body tissues, including muscles, organs, and enzymes.
 - (ii) **Amino Acids:** The building blocks of proteins, some of which are essential and must be obtained through the diet.
 - (iii) **Food Sources :** Lean meats, poultry, fish, dairy products, legumes, nuts, seeds, and

Ans :

Term-I, 2021-22

(c) Fats and Oil

Although fats and oils are energy-dense, in this context “energy-giving foods” typically refer to carbohydrates, which provide quick energy. Fats mainly serve as energy storage rather than immediate energy sources during physical activities.

11. Match the following minerals with their functions:

	Minerals		Functions
1	Iron	i	Found in red blood cell
2	Calcium	ii	Found in thyroid hormone
3	Sodium	iii	Needed for muscle contraction
4	Iodine	iv	For healthy bone and teeth and phosphorus

Select the correct answer :

- 1 2 3 4
 (a) i iv iii ii
 (b) i iv ii iii
 (c) i ii iii iv
 (d) i ii iv iii

Ans :

Term-I, 2021-22

(a) 1-(i), 2-(iv), 3-(iii), 4-(ii)

The correct match : Iron is found in red blood cells (i); Calcium is essential for healthy bones and teeth (iv); Sodium is needed for muscle contraction (iii); Iodine is vital for thyroid hormone production (ii).

12. The food component present in sugar is

- (a) fats
 (b) protein
 (c) vitamin
 (d) carbohydrate.

Ans :

SQP 2020

(d) carbohydrate.

Sugar is composed mainly of carbohydrates. These are the body's primary source of energy, particularly for brain function and physical activity, making carbohydrates an essential nutrient in the diet.

13. The main source of Vitamin C is

- (a) guava
 (b) egg
 (c) milk
 (d) banana.

Ans :

COMP 2020

(a) guava

Guava is exceptionally rich in Vitamin C, an antioxidant that supports immune function, skin health, and collagen production. Regular consumption of guava helps maintain adequate Vitamin C levels and overall well-being.

14. Which one of the following is a food that is high in 'fats'?

- (a) Oranges
 (b) Bread
 (c) Red meat
 (d) Tomatoes

Ans :

2020 C

(c) Red meat

Red meat is recognized as a high-fat food because it contains significantly more saturated fats compared to fruits like oranges or vegetables like tomatoes and grains such as bread. Its fat content is higher, making red meat the correct option.

15. The vitamins soluble in water are :

- (a) Vitamin C and B
 (b) Vitamin K and E
 (c) Vitamin D and A
 (d) All of these.

Ans :

2020 C

(a) Vitamin C and B

Vitamins that dissolve in water are classified as water-soluble, including vitamin C and the B complex vitamins. These nutrients are not stored extensively in the body, require daily intake, and differ from fat-soluble vitamins, which are stored in adipose tissue.

16. Which of the following is NOT the cause of Food Intolerance ?

- (a) Toxins formation due to food poisoning
 (b) Absence of an enzyme
 (c) Roughage
 (d) Gluten

Ans :

2024

(c) Roughage

Food intolerance results from specific digestive challenges like enzyme deficiencies or toxin exposure, whereas roughage, being dietary fiber, supports healthy digestion. Roughage does not provoke food intolerance; instead, it enhances gastrointestinal function by facilitating regular bowel movements and nutrient absorption.

17. _____ refers to inability to digest particular kind of food
- Food Myths
 - Food Intolerance
 - Food Tolerance
 - Healthy Food

Ans :

Term-I, 2021-22

- (b) Food intolerance

Food intolerance is the inability to digest specific foods properly, often due to enzyme deficiencies or other metabolic disorders. Unlike food allergies, which trigger immune responses, food intolerance results from digestive system limitations, causing discomfort without eliciting severe allergic reactions.

18. **Assertion (A) :** Consuming food that are low in calories and fat, and increasing in physical activity will help in maintaining a healthy weight.

Reason (R) : There are several ways of assessing a healthy body weight that include weight and height chart, Body Mass Index (BMI) or assessment of body fat percentage.

In the context of above two statements, which one of the following correct

- Both A and R are true and R is the correct explanation of A
- Both A and R are true but R is not the correct explanation of A
- A is true, but R is false
- A is false, but R is true

Ans :

Term-I, 2021-22

- (b) Both A and R are true but R is not the correct explanation of A

The assertion is valid—low-calorie, low-fat diets with physical activity help maintain a healthy weight. Although the reason is true, listing weight assessment methods doesn't explain why such a diet and exercise regimen ensures healthy weight maintenance, making it an unrelated explanation.

19. Which statement is not true about food myths?
- Don't drink water during meal
 - Eating potatoes increases obesity
 - The fewer the carbohydrates, healthier you are
 - Vitamins are essential for your body

Ans :

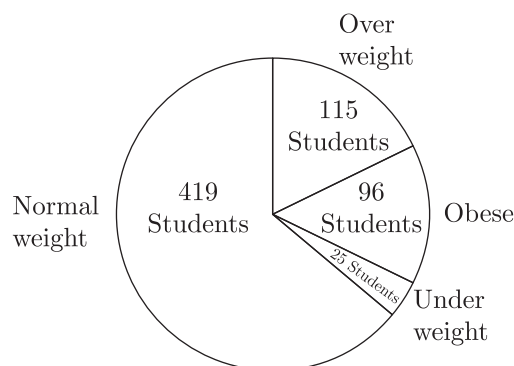
Term-I, 2021-22

- (d) Vitamins are essential for your body

Food myths commonly promote inaccurate

ideas like avoiding water during meals, potatoes increasing obesity, or fewer carbohydrates being healthier. However, stating that vitamins are nonessential is incorrect because vitamins are vital nutrients that support numerous bodily functions and overall health.

20. The XYZ school conducted a research in their school and checked the BMI of all students and they have shared their findings as depicted in the figure :



According to the above data, how many students are at risk of their health

- 419
- 211
- 121
- 236

Ans :

Term-I, 2021-22

- (d) 236

“Risk” categories generally include underweight, overweight, and obese students. From the chart, the sum of these three categories is 236. Therefore, 236 students have BMI values outside the healthy range, placing them at potential risk for weight-related health issues.

21. Slow twitch fibres are _____ in colour.

- White
- Red
- Transparent
- Brown

Ans :

2022-23

- (b) Red

Slow-twitch fibers have a high myoglobin content, giving them a red appearance. They rely primarily on aerobic metabolism, which requires oxygen. These fibers are better suited for endurance and prolonged activities, in contrast to fast-twitch (white) fibers geared for quick, powerful bursts.

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22. Which amongst these is not a micro mineral?

- (a) Iodine
- (b) Magnesium
- (c) Iron
- (d) Copper

Ans :

2022-23

- (b) Magnesium

Micro (trace) minerals are required in minute amounts (e.g., iron, iodine, copper). Magnesium, though essential, is typically classified among macro minerals because the body needs larger quantities. Hence, magnesium does not fit the definition of a micro mineral.

23. **Assertion (A)** : UNICEF says that water is not included in macro nutrients but USDA includes it as part of macronutrients.

Reason (R) : Water must be taken in large quantities therefore it can be considered a macronutrient.

- (a) Both A and R are true, but R is not the correct explanation of A.
- (b) A is true, but R is false.
- (c) Both A and R are true and R is the correct explanation of A.
- (d) A is false, but R is true.

Ans :

Term-I, 2021-22

- (c) Both A and R are true and R is the correct explanation of A.

Water is often excluded from lists of macronutrients by some agencies (UNICEF) but included by others (USDA). Because water is consumed in large amounts and is vital for physiological processes, it can be regarded as a macronutrient, making the reason valid.

24. **Assertion (A)** : Scurvy is caused due to the deficiency of Vitamin C.

Reason (R) : The disease sets in when the diet does not include fresh vegetables and fruits for a long time.

Which one of the following statements is correct?

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

Ans :

2023-24

- (b) Both A and R are true but R is not the correct explanation of A.

Scurvy is indeed caused by a lack of Vitamin C. While insufficient fresh produce contributes to deficiency, the statement doesn't fully explain the biochemical cause (collagen synthesis failure). Therefore, the reason, though true, is not the direct explanation.

25. One gram of carbohydrate contains _____ calories.

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Ans :

2023-24

- (c) 4

Carbohydrates provide approximately 4 kilocalories (kcal) per gram. They are a primary energy source, especially for the brain and muscles. Proteins also supply about 4 kcal/gram, whereas fats are more energy-dense at around 9 kcal/gram.

26. Carbohydrates which are soluble in water and crystalline in structure.

- (a) Simple
- (b) Complex
- (c) Compound
- (d) Complicated

Ans :

2022-23

- (a) Simple

Simple carbohydrates, such as glucose and sucrose, dissolve in water and form crystalline solids. These quick-release carbs are easily digested and rapidly absorbed, providing a fast energy source. Complex carbohydrates, in contrast, are generally not water-soluble or crystalline.

27. What is the other name for Vitamin B2 ?

- (a) Niacin
- (b) Thiamin
- (c) Folic Acid
- (d) Riboflavin

Ans :

Term-I, 2021-22

- (d) Riboflavin

Vitamin B2 is commonly called riboflavin. It is essential for energy production, cellular function, and the metabolism of fats and drugs. Deficiency can lead to issues like skin disorders, cracks at the mouth corners, and inflamed tongue.

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28. Which amongst these is not a macro mineral?

- (a) Calcium
- (b) Potassium
- (c) Phosphorus
- (d) Iodine

Ans :

Term-I, 2021-22

- (d) Iodine

Macro minerals (e.g., calcium, phosphorus, potassium) are required in larger quantities. Iodine, however, is a trace (micro) mineral needed only in tiny amounts. Despite its small requirement, iodine is critical for normal thyroid function and metabolic regulation.

29. Who discovered Vitamin A?

- (a) Dr. Mc Collum
- (b) Dr. Coubertin
- (c) Dr. J.B.Nash
- (d) Dr. Harvard

Ans :

Term-I, 2021-22

- (a) Dr. McCollum

Dr. Elmer V. McCollum, an American biochemist, played a key role in identifying Vitamin A. His research helped reveal this vitamin's significance in vision, immune function, and growth, marking a milestone in nutritional science.

30. What according to you is the main cause for night blindness?

- (a) Deficiency of Vit. E
- (b) Deficiency of Vit. C
- (c) Deficiency of Vit. A
- (d) Deficiency of Vit. D

Ans :

Term-I, 2021-22

- (c) Deficiency of Vit. A

Night blindness (nyctalopia) often arises from inadequate vitamin A, which is crucial for producing rhodopsin in the retina. This pigment helps vision in low-light conditions. Deficiency impairs dark adaptation, leading to difficulty seeing in dim or dark environments.

31. What is the ratio of carbon, hydrogen and oxygen in carbohydrates?

- (a) 1 : 2 : 1
- (b) 2 : 2 : 1
- (c) 2 : 1 : 1
- (d) 1 : 2 : 2

Ans :

Term-I, 2021-22

- (a) 1 : 2 : 1

Carbohydrates generally follow the formula

$C_nH_{2n}O_n$. This 1:2:1 ratio is evident in simple sugars like glucose $C_6H_{12}O_6$. Complex carbohydrates are composed of repeating units of these monosaccharides linked together.

32. Match the following:

1.	Vitamin B ₁₂	(A)	Thiamin
2.	Vitamin B ₃	(B)	Biotin
3.	Vitamin B ₇	(C)	Cobalamin
4.	Vitamin B ₁	(D)	Niacin

Select the correct answer:

1 2 3 4

- (a) A B C D
- (b) C D B A
- (c) D C A B
- (d) A C D B

Ans :

Term-I, 2021-22

- (b) 1-C, 2-D, 3-B, 4-A

Vitamin B₁₂ = Cobalamin (C)

Vitamin B₃ = Niacin (D)

Vitamin B₇ = Biotin (B)

Vitamin B₁ = Thiamin (A)

This matching reflects standard nomenclature of B-complex vitamins.

33. Which statement is not true about protein?

- (a) Protein forms new tissues
- (b) Protein regulates the balance of water and acids
- (c) Protein helps in production of hormones.
- (d) Protein makes antibodies.

Ans :

Term-I, 2021-22

- (c) Protein helps in production of hormones.

Although some hormones (like insulin) are protein-based, many hormones are steroid or amino-acid derivatives. The statement "protein helps in production of hormones" is too general. Proteins primarily form tissues, regulate water balance, and help produce antibodies, not all hormones.

34. Match the following vitamin with the disease caused due to their deficiency

1.	Vitamin A	(A)	Rickets
2.	Vitamin B	(B)	Night blindness
3.	Vitamin C	(C)	Beriberi
4.	Vitamin D	(D)	Scurvy

- | | | | | |
|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| (a) | A | B | C | D |
| (b) | B | C | D | A |
| (c) | B | A | C | D |
| (d) | C | B | A | D |

Ans :

Term-I, 2021-22

(b) 1-B, 2-C, 3-D, 4-A

Vitamin A Night blindness (B)

Vitamin B Beriberi (C)

Vitamin C Scurvy (D)

Vitamin D Rickets (A)

Each vitamin is linked to a distinct deficiency condition.

- 35.** Jatin is a weightlifter in the 96 kg category. He has to participate in a weightlifting competition next week for which he is taking good care of his practice and diet. He has included all the essential nutrients in his diet. Based on this case, answer the following questions.

What do you think would be the most important component of Jatin's diet?

- (a) Proteins
(b) Carbohydrates
(c) Vitamins
(d) Minerals

Ans :

Term-I, 2021-22

(a) Proteins

Weightlifters require ample protein for muscle repair and growth. Proteins supply amino acids that rebuild and strengthen muscle tissue stressed by resistance training. Carbohydrates and fats are also important, but protein is key to hypertrophy and recovery.

- 36.** Calculate the BMI of a girl and identify the category if her weight is 68 kg and height is 161 cm.

- (a) Underweight
(b) Normal weight
(c) Overweight
(d) Obesity class I

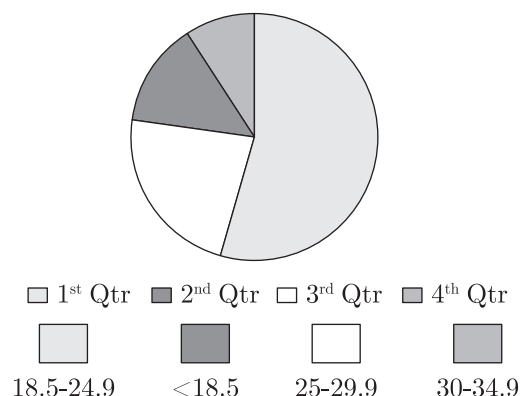
Ans :

Term-I, 2021-22

(c) Overweight

$BMI = \text{weight (kg)} / [\text{height (m)}]^2 = 68 / (1.61 \times 1.61) \approx 26.2$. A BMI between 25 and 29.9 is classified as overweight. Hence, her weight category is "overweight" according to standard BMI cutoffs.

- 37.** Below given is the BMI data of a school's health check-up



In which category does the major student population fall into?

- (a) Obese
(b) Underweight
(c) Normal weight
(d) Overweight

Ans :

Term-I, 2021-22

(c) Normal weight

The largest portion of students, as indicated by the provided chart, falls into the "normal weight" BMI range. This suggests most students maintain a healthy weight relative to their height, thus forming the majority in the dataset.

- 38.** In which of the following food groups "Sugar and jaggery" come under?

- (a) Protective or regulatory foods
(b) Energy giving foods
(c) Body building foods
(d) Immunity boosters foods

Ans :

DELHI 2017

(b) Energy giving foods

Energy giving foods

Sugar and jaggery are primarily carbohydrates, providing quick energy. They lack significant protein or protective nutrients, so they are classified under energy-giving foods rather than protective, regulatory, or body-building food categories.

- 39.** Nutrition is _____ Substance.

- (a) Biological
(b) Chemical
(c) Energy
(d) Mechanical

Ans :

OD 2009

Ans :

COMP 2017

(b) Sustained energy and hydration
During competitions, maintaining sustained energy levels and proper hydration is crucial. Athletes consume easily digestible carbohydrates and fluids to replace lost electrolytes and prevent fatigue. This nutritional strategy supports continuous performance and reduces the risk of cramps and energy depletion.

68. What is the primary nutritional goal during the post-competition phase?

- (a) Muscle recovery and rehydration
- (b) Fasting
- (c) High sugar consumption
- (d) Excessive fat intake

Ans :

DELHI 2009

(a) Muscle recovery and rehydration
Post-competition nutrition focuses on muscle recovery, replenishing glycogen stores, and rehydrating the body. Consuming proteins, carbohydrates, and fluids after exercise supports repair of muscle tissues, reduces inflammation, and aids in overall recovery to restore performance capacity efficiently.

69. Which meal pattern best exemplifies a balanced diet for athletes?

- (a) Skipping breakfast and heavy dinner
- (b) Regular, well-balanced meals
- (c) Only high-protein meals
- (d) Fasting intermittently

Ans :

OD 2006

(b) Regular, well-balanced meals
Regular, well-balanced meals exemplify a balanced diet by providing consistent nutrient intake throughout the day. This approach ensures steady energy, supports metabolic processes, promotes recovery, and optimizes athletic performance through a steady supply of essential macro and micro nutrients.

70. Why are macro-nutrients especially important for sports performance?

- (a) They provide essential building blocks for energy and recovery
- (b) They are not important
- (c) They only add weight
- (d) They reduce muscle strength

Ans :

FOREIGN 2001

(a) They provide essential building blocks for energy and recovery

Macro-nutrients, including carbohydrates, proteins, and fats, provide the energy necessary for performance, muscle repair, and recovery. They serve as fundamental building blocks for tissue synthesis, fuel metabolic processes, and support endurance, strength, and overall athletic performance during training.

71. Which role do micro-nutrients play in an athlete's diet?

- (a) Provide high calories
- (b) Facilitate metabolic reactions and support enzyme functions
- (c) Cause weight gain
- (d) Replace macro-nutrients

Ans :

SQP 2004

(b) Facilitate metabolic reactions and support enzyme functions

Micro-nutrients, such as vitamins and minerals, are essential for facilitating metabolic reactions, supporting enzyme functions, and maintaining cellular health. Although required in small amounts, they are critical for energy production, immune function, and overall performance, ensuring efficient bodily processes during training.

72. Which dietary strategy is recommended for maintaining a healthy weight in athletes?

- (a) Extreme calorie restriction
- (b) Balanced, nutrient-dense meals
- (c) Skipping meals regularly
- (d) High sugar diet

Ans :

COMP 2010

(b) Balanced, nutrient-dense meals
A healthy weight for athletes is best maintained through balanced, nutrient-dense meals. This strategy ensures adequate energy, supports metabolic function, prevents nutrient deficiencies, and promotes recovery while preventing the pitfalls of crash dieting and unsustainable weight-loss practices for long-term performance.

73. Which dieting pitfall can negatively affect athletic performance?

- (a) Gradual calorie reduction
- (b) Crash dieting
- (c) Balanced macronutrient intake
- (d) Proper hydration

Ans :

COMP 2012

(b) Crash dieting
Crash dieting is a significant pitfall that can adversely affect athletic performance by causing

47. What is an ideal weight to be reduced in one week?

- (a) 250 gms to 500gms
- (b) 500 gms to 1 kg
- (c) 1 kg to 1.5 kg
- (d) kg to 2 kgs

Ans :

COMP 2002

- (a) 250 gms to 500 gms

Safe, sustainable weight loss usually falls between 0.25 and 0.5 kilograms (0.5–1 pound) per week. Losing weight too rapidly can lead to nutrient deficiencies, muscle loss, and metabolic imbalances, making gradual reduction the healthier long-term approach.

48. BMI between 25.0–29.9 is _____

- (a) under weight
- (b) normal
- (c) overweight
- (d) obese

Ans :

DELHI 2010

- (c) Overweight

Standard BMI categories designate 25.0–29.9 as overweight. Below 18.5 is underweight, 18.5–24.9 is normal, and 30 or above is obese. This classification helps identify potential health risks related to body weight.

49. Range of protein intake is

- (a) 5g/kg body weight to 1 g/kg body weight
- (b) 1g/kg body weight to 2 g/kg body weight
- (c) 2g/kg body weight to 3 g/kg body weight
- (d) 3g/kg body weight to 4 g/kg body weight

Ans :

OD 2012

- (b) 1g/kg body weight to 2 g/kg body weight

Active individuals or athletes typically need more protein than sedentary people, generally 1–2 g/kg daily. This range supports muscle repair, recovery, and maintenance without excessive intake that could stress kidneys or displace other vital nutrients.

50. Approximately, how much carbohydrate is required for strength dominant sports?

- (a) 40%
- (b) 55%
- (c) 70%
- (d) 80%

Ans :

FOREIGN 2015

- (b) 55%

Strength-focused athletes often need moderate-to-high carbohydrate intake—around 55% of total calories—to ensure sufficient glycogen stores for training. While protein is crucial for muscle repair, carbohydrates provide the primary fuel during high-intensity, strength-based workouts and support recovery.

51. What does a balanced diet primarily ensure?

- (a) Excess calories
- (b) Equal amounts of all foods
- (c) Appropriate nutrient intake
- (d) Only vitamins and minerals

Ans :

SQP 2011

- (c) Appropriate nutrient intake

A balanced diet ensures the intake of appropriate amounts of proteins, carbohydrates, fats, vitamins and minerals required for optimal bodily function, energy production and overall health. It supports growth, repair and performance, creating a foundation for both daily life and athletic endeavors.

52. Which of the following best describes nutrition?

- (a) Only calorie counting
- (b) Study of nutrient intake and its effects
- (c) Ignoring vitamins
- (d) Consuming junk food

Ans :

COMP 2013

- (b) Study of nutrient intake and its effects

Nutrition is the study of how nutrient intake affects the body's functions, growth and performance. It encompasses the absorption, metabolism and utilization of nutrients, guiding dietary choices for health maintenance and optimized sports performance in various populations.

53. Which category does protein belong to?

- (a) Micro-nutrient
- (b) Macro-nutrient
- (c) Non-nutritive
- (d) Vitamin

Ans :

DELHI 2015

- (b) Macro-nutrient

Protein is a macro-nutrient, essential for muscle repair, growth and maintenance. It supplies amino acids necessary for bodily functions, supports immune health and plays a critical role in metabolic processes, particularly important for active individuals and athletes.

(b) Chemical

Nutrients—carbohydrates, proteins, fats, vitamins, and minerals—are chemical substances. They undergo various chemical reactions in the body, supplying energy, structural components, and regulatory factors. Hence, “chemical” most accurately describes the fundamental nature of nutrition.

40. Which is NOT a Micronutrient?

- (a) Macro Minerals
- (b) Trace Minerals
- (c) Vitamins
- (d) Protein

Ans :

FOREIGN 2006

(d) Protein

Micronutrients (vitamins, minerals) are needed in small quantities. Protein is a macronutrient required in larger amounts for muscle growth, tissue repair, and enzyme/hormone formation. Thus, protein is not considered a micronutrient.

41. Which of the following is a water-soluble vitamin?

- (a) Vitamin A
- (b) Vitamin B
- (c) Vitamin D
- (d) Vitamin K

Ans :

SQP 2001

(b) Vitamin B

The B-complex group and Vitamin C dissolve in water. In contrast, Vitamins A, D, E, and K are fat-soluble, stored in body tissues. Because Vitamin B is water-soluble, regular intake is required to prevent deficiency.

42. Iron is a part of

- (a) trace minerals
- (b) macro minerals
- (c) vitamins
- (d) carbohydrate

Ans :

COMP 2004

(a) trace minerals

Iron is essential in small amounts for hemoglobin production and oxygen transport. It's categorized as a trace (micro) mineral. Macro minerals, like calcium and magnesium, are needed in larger quantities than trace minerals.

43. Fats and oils come under:

- (a) protective or regulatory foods
- (b) energy giving foods

(c) bodybuilding group

(d) routine foods

Ans :

DELHI 2007

(b) Energy giving foods

Fats and oils provide about 9 kcal per gram, making them the most energy-dense macronutrient. They're categorized as energy-giving foods rather than protective or body-building foods, although they also assist in vitamin absorption and hormone production.

44. 1 gram of fat provides

- (a) 3 kcal
- (b) 4 Kcal
- (c) 5 Kcal
- (d) 9 Kcal

Ans :

OD 2003

(d) 9 Kcal

Fats are the most concentrated energy source. One gram of fat yields roughly 9 kilocalories, more than carbohydrates or proteins (both ~4 kcal/gram). This high energy density makes fats vital for stored energy and certain bodily functions.

45. Anthocyanins give colour to

- (a) roots
- (b) coffee
- (c) wheat
- (d) grapes

Ans :

FOREIGN 2008

(d) Grapes

Anthocyanins are pigments responsible for red, purple, and blue hues in fruits and vegetables. Grapes (particularly red/purple varieties) owe their rich color to these compounds, which also act as antioxidants with various potential health benefits.

46. Oxalates are presents in

- (a) green leafy vegetables
- (b) bajara
- (c) nuts
- (d) spices

Ans :

SQP 2006

(a) Green leafy vegetables

Spinach, kale, and other leafy greens often contain oxalates (oxalic acid), which can bind to minerals like calcium. While beneficial in moderation, excessive intake may lead to kidney stone formation in susceptible individuals.

endurance, energy production and overall athletic performance by ensuring efficient oxygen delivery to working muscles during exercise.

- 61.** Which component of the diet provides essential calories and building blocks for the body?

(a) Nutritive components
(b) Non-nutritive components
(c) Artificial additives
(d) Water only

Ans :

SQP 2006

(a) Nutritive components

Nutritive components of the diet, such as proteins, carbohydrates, fats, vitamins, and minerals, provide essential calories and building blocks for growth, repair, and maintenance of body tissues. They are indispensable for energy production, metabolic processes, and overall health, especially in sports.

- 62.** Which of the following is considered a non-nutritive component in the diet?

(a) Dietary fiber
(b) Carbohydrates
(c) Proteins
(d) Fats

Ans :

COMP 2002

(a) Dietary fiber

Dietary fiber is a non-nutritive component that does not provide calories but is essential for digestive health. It aids in regulating blood sugar, lowering cholesterol, and promoting satiety. Fiber plays a supportive role in overall health and is vital for balanced nutrition.

- 63.** What is one major pitfall of extreme dieting for weight control?

(a) Improved metabolism
(b) Nutrient deficiencies
(c) Enhanced performance
(d) Balanced hormones

Ans :

DELHI 2015

(b) Nutrient deficiencies

Extreme dieting for weight control can lead to nutrient deficiencies by severely limiting food intake and variety. This approach compromises energy levels, impairs metabolic function, and can negatively impact athletic performance, overall health, and long-term weight management efforts if not managed properly.

- 64.** What does food intolerance refer to?

(a) Immune-mediated allergy
(b) Inability to digest certain foods
(c) Preference for bland foods
(d) Excessive nutrient absorption

Ans :

OD 2019

(b) Inability to digest certain foods

Food intolerance is the inability to digest or properly process certain foods, resulting in gastrointestinal discomfort and other adverse symptoms. Unlike food allergies, intolerance does not involve the immune system and requires careful dietary adjustments to avoid triggering discomfort and maintain health.

- 65.** Which of the following is an example of a common food myth?

(a) Eating fat makes you gain weight
(b) Balanced diet prevents obesity
(c) Carbohydrates are essential
(d) Vitamins support immunity

Ans :

FOREIGN 2014

(a) Eating fat makes you gain weight

The myth that eating fat automatically leads to weight gain is a common misconception. In reality, healthy fats are essential for hormone production, cell structure, and energy. Their proper inclusion in a balanced diet supports overall health and optimal sports performance effectively.

- 66.** What is the primary purpose of pre-competition nutrition?

(a) To increase fatigue
(b) To boost energy and focus
(c) To induce dehydration
(d) To reduce muscle mass

Ans :

SQP 2016

(b) To boost energy and focus

Pre-competition nutrition aims to provide energy, improve focus, and optimize performance. Consuming the right balance of carbohydrates, proteins, and fluids before an event ensures that athletes have sufficient fuel, maintain blood sugar levels, and achieve peak mental and physical readiness for competition.

- 67.** During sports competitions, what is the key nutritional focus?

(a) Weight gain
(b) Sustained energy and hydration
(c) Excess protein intake
(d) Skipping meals

54. Which category do vitamins belong to?

- (a) Macro-nutrient
- (b) Micro-nutrient
- (c) Non-nutritive
- (d) Energy source

Ans :

OD 2019

- (b) Micro-nutrient

Vitamins are micro-nutrients required in small quantities for various metabolic processes, enzyme functions, and overall cellular health. They support immunity, energy production, and tissue repair, making them essential for maintaining health, especially during rigorous physical training and competition.

55. Which macro-nutrient is the primary energy source during high-intensity sports?

- (a) Fats
- (b) Proteins
- (c) Carbohydrates
- (d) Minerals

Ans :

FOREIGN 2014

- (c) Carbohydrates

Carbohydrates are the primary energy source during high-intensity sports. They are quickly metabolized to produce ATP, essential for muscle contraction and endurance. Adequate carbohydrate intake before and during exercise supports performance and delays the onset of fatigue effectively.

56. Which food source is rich in high-quality proteins?

- (a) Fruits
- (b) Whole grains
- (c) Lean meats
- (d) Sugary drinks

Ans :

SQP 2016

- (c) Lean meats

Lean meats provide high-quality proteins that contain all essential amino acids. They support muscle repair, growth, and recovery, making them especially beneficial for athletes and active individuals who require optimal protein intake for strength, endurance, and overall sports performance.

57. What is the primary function of carbohydrates in sports nutrition?

- (a) Muscle repair
- (b) Energy provision
- (c) Bone strengthening
- (d) Vitamin storage

Ans :

COMP 2018

- (b) Energy provision

Carbohydrates primarily provide energy by breaking down into glucose, which fuels muscle contraction and brain function. During physical activity, sufficient carbohydrate intake ensures sustained energy levels, delays fatigue, and supports endurance and overall athletic performance effectively.

58. Which nutrient is essential for hormone production and long-term energy storage?

- (a) Carbohydrates
- (b) Proteins
- (c) Fats
- (d) Vitamins

Ans :

DELHI 2007

- (c) Fats

Fats are essential for hormone production, insulation, and long-term energy storage. They contribute to cell structure, assist in the absorption of fat-soluble vitamins, and provide a concentrated energy source. Adequate fat intake is vital for endurance, recovery, and overall metabolic health.

59. Which vitamin is classified as fat-soluble?

- (a) Vitamin C
- (b) Vitamin B6
- (c) Vitamin D
- (d) Vitamin B12

Ans :

OD 2003

- (c) Vitamin D

Vitamin D is a fat-soluble vitamin, stored in body tissues and essential for calcium absorption and bone health. It supports immune function and muscle performance, making it especially important for athletes and active individuals to maintain optimal skeletal strength and overall health.

60. Which mineral is crucial for oxygen transport in the blood?

- (a) Calcium
- (b) Iron
- (c) Zinc
- (d) Magnesium

Ans :

FOREIGN 2008

- (b) Iron

Iron is a crucial mineral for oxygen transport in the blood, as it forms a key component of hemoglobin. Adequate iron levels support

rapid nutrient deficiencies, muscle loss, and metabolic slowdown. This unsustainable approach reduces energy, impairs recovery, and jeopardizes overall health, making it detrimental to sustained sports performance and fitness goals.

74. What role do carbohydrates play for athletes?

- (a) They are a minor energy source
- (b) They are the primary energy source
- (c) They only build muscle
- (d) They have no function

Ans :

DELHI 2015

(b) They are the primary energy source
Carbohydrates serve as the primary energy source for athletes. They are rapidly converted into glucose, fueling muscle activity during exercise. Adequate carbohydrate intake ensures sustained energy, delays fatigue, and supports high-intensity performance, particularly during prolonged or strenuous athletic events.

75. How do proteins support athletes in their training?

- (a) They provide no benefit
- (b) They repair and build muscle tissue
- (c) They act as primary energy sources
- (d) They hinder muscle growth

Ans :

OD 2011

(b) They repair and build muscle tissue
Proteins are essential for repairing and building muscle tissue after training. They supply amino acids needed for muscle recovery, growth, and maintenance, which is crucial for strength development, injury prevention, and overall performance enhancement in sports and physical activities.

76. What essential function do fats serve in sports nutrition?

- (a) They provide no calories
- (b) They supply essential fatty acids and support hormone production
- (c) They are harmful in all amounts
- (d) They replace proteins

Ans :

FOREIGN 2013

(b) They supply essential fatty acids and support hormone production
Fats supply essential fatty acids, support hormone production, and provide a concentrated source of energy. They are crucial for maintaining cell integrity, absorbing fat-soluble vitamins, and sustaining long-term energy needs during low to moderate-intensity exercise in athletic training.

77. Why is proper hydration critical for athletes?

- (a) It increases dehydration risk
- (b) It maintains performance, supports temperature regulation, and prevents fatigue
- (c) It reduces blood volume
- (d) It has no impact on performance

Ans :

SQP 2017

(b) It maintains performance, supports temperature regulation, and prevents fatigue
Proper hydration is critical for athletes because it maintains performance, aids in temperature regulation, and prevents fatigue. Water is essential for metabolic processes, circulation, and muscle function, ensuring optimal physiological function and reducing the risk of dehydration during intense physical activity.

78. How does eating frequency influence metabolism in athletes?

- (a) Infrequent meals boost metabolism
- (b) Regular meals support steady metabolic rates
- (c) Skipping meals increases energy
- (d) Meal frequency has no effect

Ans :

COMP 2009

(b) Regular meals support steady metabolic rates
Regular meals help maintain a steady metabolic rate by providing consistent energy and nutrient supply. This regularity supports optimal digestion, prevents blood sugar fluctuations, and enhances recovery. Consistent meal timing is essential for athletes to sustain energy levels throughout training and competition.

79. Which role do vitamins play in energy metabolism?

- (a) They store energy
- (b) They act as co-factors for enzymatic reactions
- (c) They provide direct energy
- (d) They inhibit metabolism

Ans :

DELHI 2006

(b) They act as co-factors for enzymatic reactions
Vitamins act as co-factors for numerous enzymatic reactions involved in energy metabolism. They facilitate the conversion of food into energy, support cellular respiration, and ensure efficient functioning of metabolic pathways, thereby playing a vital role in overall energy production and athletic performance.

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80. Which mineral is essential for maintaining electrolyte balance during exercise?

- (a) Iron
- (b) Sodium
- (c) Calcium
- (d) Zinc

Ans :

OD 2001

- (b) Sodium

Sodium is essential for maintaining electrolyte balance and proper fluid distribution during exercise. It helps regulate nerve impulses, muscle contractions, and hydration status. Adequate sodium levels prevent cramping and fatigue, supporting endurance and sustained athletic performance under strenuous conditions.

81. What distinguishes nutritive from non-nutritive components in the diet?

- (a) Nutritive components provide calories and essential nutrients
- (b) Non-nutritive components provide all energy
- (c) Both supply equal calories
- (d) Non-nutritive components are toxic

Ans :

FOREIGN 2004

- (a) Nutritive components provide calories and essential nutrients

Nutritive components supply calories and essential nutrients such as proteins, carbohydrates, fats, vitamins, and minerals. In contrast, non-nutritive components, like fiber, do not provide calories but support digestive health. Both are important in creating a balanced diet that promotes overall health.

82. What is the primary benefit of dietary fiber in the diet?

- (a) It increases blood sugar
- (b) It aids digestion and regulates bowel movements
- (c) It provides high energy
- (d) It builds muscle

Ans :

SQP 2007

- (b) It aids digestion and regulates bowel movements

Dietary fiber aids digestion by promoting regular bowel movements, reducing cholesterol levels, and stabilizing blood sugar levels. Although non-caloric, it supports digestive health, prevents constipation, and contributes to long-term gastrointestinal well-being, making it a crucial component of a balanced diet.

83. Which nutritional strategy is important for endurance athletes?

- (a) High-fat, low-carb diet
- (b) High-carbohydrate diet for energy replenishment
- (c) Minimal fluid intake
- (d) Excessive protein consumption

Ans :

COMP 2003

- (b) High-carbohydrate diet for energy replenishment

Endurance athletes benefit from a high-carbohydrate diet that replenishes glycogen stores, provides sustained energy, and supports prolonged physical activity. Adequate carbohydrate intake is essential for delaying fatigue, enhancing performance, and facilitating recovery during extended training sessions and competitions.

84. Which nutritional strategy supports strength athletes during training?

- (a) Low-protein, high-carb diet
- (b) High-protein diet for muscle repair and growth
- (c) Minimal calorie intake
- (d) Low hydration levels

Ans :

DELHI 2008

- (b) High-protein diet for muscle repair and growth
- Strength athletes require a high-protein diet to repair and build muscle tissues. Protein provides essential amino acids necessary for muscle recovery, increases strength, and supports anabolic processes. Adequate protein intake, combined with proper training, is critical for optimal performance and muscle hypertrophy.

85. Why is hydration emphasized in pre-, during, and post-sports nutrition?

- (a) It is not important
- (b) It supports metabolic processes, aids digestion, and prevents dehydration
- (c) It reduces energy levels
- (d) It causes weight gain

Ans :

OD 2006

- (b) It supports metabolic processes, aids digestion, and prevents dehydration

Hydration is essential in sports nutrition because it supports metabolic processes, regulates body temperature, aids digestion, and prevents dehydration. Consistent fluid intake ensures optimal performance, enhances recovery, and maintains overall physiological balance during

intense physical activities.

- 86.** How does a balanced diet influence immune function in athletes?
- It suppresses immunity
 - It enhances immune response through essential nutrients
 - It has no effect
 - It only causes weight loss

Ans :

FOREIGN 2002

(b) It enhances immune response through essential nutrients

A balanced diet supplies essential nutrients that enhance immune response by supporting the production and function of immune cells. Adequate vitamins, minerals, proteins, and antioxidants help protect against infections, improve recovery, and maintain overall health, thereby supporting athletic performance.

- 87.** What does nutrient timing refer to in sports nutrition?
- Eating randomly
 - Strategically scheduling nutrient intake around exercise
 - Avoiding meals
 - Skipping breakfast

Ans :

SQP 2010

(b) Strategically scheduling nutrient intake around exercise

Nutrient timing refers to strategically planning meals and snacks around training and competition to optimize energy levels, recovery, and performance. This approach ensures that essential nutrients are available when needed most, supporting muscle repair, glycogen replenishment, and overall athletic efficiency.

- 88.** Which food myth is commonly associated with sports nutrition?
- Carbohydrates cause weight gain
 - Proteins aid muscle growth
 - Fats are essential for hormones
 - Vitamins support immunity

Ans :

COMP 2012

(a) Carbohydrates cause weight gain

A common food myth in sports nutrition is that carbohydrates inherently cause weight gain. In reality, carbohydrates are a critical energy source, and when consumed in appropriate amounts, they support performance, recovery, and overall health without causing unwanted weight gain in active

individuals.

- 89.** Which food source is best known for its high fiber content and sustained energy release?
- Refined sugar
 - Whole grains
 - Processed snacks
 - Sugary beverages

Ans :

DELHI 2005

(b) Whole grains

Whole grains are rich in dietary fiber and provide sustained energy release. They support digestive health, stabilize blood sugar levels, and offer essential vitamins and minerals. Their slow-digesting carbohydrates make them an excellent choice for athletes requiring long-lasting fuel during physical activities.

- 90.** What is a significant pitfall of fad diets in sports nutrition?
- They provide balanced nutrition
 - They lead to nutrient deficiencies and performance decline
 - They support muscle growth
 - They enhance endurance

Ans :

OD 2011

(b) They lead to nutrient deficiencies and performance decline

Fad diets often promise rapid weight loss but lead to nutrient deficiencies and reduced athletic performance. These unsustainable diets fail to meet energy and recovery needs, causing imbalances, decreased muscle function, and impaired overall health, which adversely affect long-term sports performance and well-being.

- 91. Assertion (A) :** A balanced diet supplies all the essential nutrients required for overall health and optimal sports performance.

Reason (R) : A balanced diet focuses solely on maintaining a specific macronutrient ratio while ignoring micronutrient intake.

- Both A and R are true, and R is the correct explanation for A.
- Both A and R are true, but R is not the correct explanation for A.
- A is true but R is false.
- Both A and R are false.

Ans :

FOREIGN 2013

(c) A is true but R is false

The assertion is true since a balanced diet must include a variety of nutrients. However, the

reason is false because micronutrients (vitamins and minerals) are equally essential, and a truly balanced diet incorporates both macro and micronutrients rather than focusing solely on macronutrient ratios.

- 92. Assertion (A) :** Macronutrients—carbohydrates, proteins, and fats—provide energy, while micronutrients play a crucial role in regulating metabolic processes.

Reason (R) : Although micronutrients do not directly provide energy, they are indispensable for enzyme functions and overall cellular metabolism.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2015

- (a) Both A and R are true, and R is the correct explanation for A

The assertion correctly distinguishes between the energy-providing role of macronutrients and the metabolic regulatory role of micronutrients. The reason further clarifies that micronutrients, despite not supplying energy, are vital for enzyme and cellular functions, making both statements true and aligned.

- 93. Assertion (A) :** Nutritive components in food provide energy and essential nutrients, whereas nonnutritive components do not contribute energy.

Reason (R) : Nonnutritive components have no physiological benefits and serve no purpose in the human diet.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2019

- (c) A is true but R is false

The assertion is correct: nutritive components deliver energy and nutrients, and nonnutritive ones (like water and dietary fiber) do not provide calories. However, the reason is false because many nonnutritive elements, such as fiber, have significant physiological benefits.

- 94. Assertion (A) :** Healthy weight management is best achieved through sustainable dietary practices rather than through extreme dieting.

Reason (R) : Extreme diets often lead to nutrient deficiencies and disrupt normal metabolic functioning over time.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2014

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is valid because long-term weight control requires balanced and sustainable eating habits. The reason is also true, as extreme dieting can cause nutrient shortfalls and metabolic imbalances, thereby directly supporting the need for sustainable dietary practices.

- 95. Assertion (A) :** Misconceptions about certain foods often lead to unnecessary restrictions that can compromise overall nutritional balance.

Reason (R) : Food intolerance is frequently mistaken for allergies, which fuels myths unsupported by scientific evidence.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2016

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is correct since unwarranted food restrictions based on myths can disrupt nutritional balance. The reason is also true; confusion between intolerance and allergies often leads to misconceptions, which supports the assertion by explaining how such myths develop and affect dietary choices.

- 96. Assertion (A) :** Sports nutrition emphasizes tailored dietary strategies before, during, and after competition to maximize performance and expedite recovery.

Reason (R) : Pre-competition meals focus on maximizing glycogen storage, while post-competition meals are designed to repair muscles

and replenish lost nutrients.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2018

- (a) Both A and R are true, and R is the correct explanation for A

The assertion accurately reflects the importance of strategic meal planning around competitions. The reason further details that pre-competition diets boost glycogen stores and post-competition nutrition aids recovery, which substantiates the assertion and confirms the correct interrelationship.

- 97. Assertion (A) :** Carbohydrates, primarily obtained from grains and fruits, serve as the main energy source for athletes.

Reason (R) : Proteins and fats are insignificant energy sources when compared to carbohydrates in terms of athletic performance.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2011

- (c) A is true but R is false

The assertion is true as carbohydrates are the primary fuel for physical activity. However, the reason is false because proteins and fats also contribute energy, albeit in different proportions and contexts, making it inaccurate to deem them insignificant in athletic performance.

- 98. Assertion (A) :** A balanced diet is not only essential for general health but also plays a crucial role in enhancing athletic performance and recovery.

Reason (R) : Achieving nutritional balance depends solely on calorie intake rather than on the diversity of nutrients consumed.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2004

- (c) A is true but R is false

The assertion correctly highlights that overall nutrient diversity supports both health and sports performance. In contrast, the reason is false since nutritional balance requires an adequate variety of macronutrients and micronutrients—not merely total calorie consumption—to ensure optimal bodily function and recovery.

TWO MARKS QUESTIONS

- 99.** What is BMI? Calculate BMI of a child whose weight is 72 kg and height 1.68 mt.

Ans :

2023

Body mass Index (BMI) is a indicator for determination of healthy weight

$$\text{BMI} = \frac{\text{Weight in kg}}{(\text{Height in metre})^2}$$

$$\text{BMI} = \frac{72}{(1.68)^2} = \frac{72}{1.68 \times 1.68} = 25.5$$

- 100.** Differentiate between Macro and micro nutrients.

Ans :

2023

Aspect	Macronutrients	Micronutrients
Amount	Large amounts (grams)	Small amounts (mg/μg)
Types	Carbohydrates, Proteins, Fats (+ Water sometimes)	Vitamins, Minerals
Functions	Energy, growth, structure	Metabolic regulation, immune support
Storage	Stored (fats, glycogen)	Limited storage
Deficiency	Muscle loss, low energy	Specific disorders (e.g., scurvy, anemia)

- 101.** Write briefly about 'Micro nutrient'.

Ans :

AI 2019

Vitamins and minerals are known as micronutrients because the body requires them in only small amounts for survival, growth, and development. Examples include vitamins A, B, C, D, E, K, and minerals such as iron, calcium, magnesium, and

iodine.

- 102.** Why is roughage considered as a necessary part of diet?

Ans : 2019 C

Roughage is an essential part of the diet because it comes from plant foods—such as whole grains, nuts, seeds, legumes, fruits, and vegetables—that the body cannot digest. However, it serves as a vital food source for beneficial gut bacteria, may support weight management and can reduce certain heart disease risk factors.

- 103.** Why does the weightlifter's diet include lots of proteins?

Ans : 2018

Proteins play a vital role in forming new tissues and repairing damaged ones. They also help maintain the strength of ligaments and tendons.

- 104.** What do you mean by food intolerance?

Ans : 2018

Food intolerance occurs when certain components in a food are not properly processed or absorbed by an individual's digestive system.

- 105.** Fats are derived from two sources. Name them.

Ans : Delhi 2017

Fats can be obtained from plant sources—such as oilseeds like mustard, soybean, sunflower, groundnut, and rice bran—as well as from animal sources like dairy products (butter, ghee) and the fat found in meat. Adequate fat intake is essential for health and for the absorption of fat-soluble vitamins.

- 106.** What is roughage or fibre in diet?

Ans : Delhi 2016 C

Roughage is the fiber found in foods that helps eliminate waste from the body. Primary sources include whole grains, cereals, breads, vegetables, and fruits.

- 107.** Enlist two sources of calcium.

Ans : Delhi 2019

1. Milk and dairy products
2. Green leafy vegetables (e.g., kale, broccoli)

- 108.** Suggest two reasons, why our body requires food supplements.

Ans :

2019

Our body requires food supplements for several reasons:

1. They provide the energy necessary for daily activities.
2. They help combat infections and diseases.
3. They support proper blood circulation.
4. They maintain a healthy immune system.

- 109.** Enlist two sources for calcium and Iron separately.

Ans : AI 2015

1. Calcium:
 - i. Milk and dairy products
 - ii. Green leafy vegetables (e.g., kale, spinach)
2. Iron:
 - i. Red meat
 - ii. Legumes (e.g., lentils, beans)

- 110.** Enlist two non-nutritive components of diet.

Ans : AI 2015

Non-nutritive Components of Diet:

1. Water
2. Dietary Fiber

- 111.** What do you mean by Dieting?

Ans : Delhi 2019

Dieting involves limiting food intake or choosing specific types of food to lose, gain, or maintain weight.

- 112.** Explain the importance of fluid intake during a competition.

Ans : 2023-24

Meeting nutritional needs during training is essential for peak performance. The primary goals during exercise are to preserve water balance, regulate body temperature, maintain stable blood sugar levels, and delay fatigue. Consequently, it's crucial to replenish the water lost through sweat to sustain fluid balance and proper body temperature.

- 113.** Define the concept of a balanced diet and explain why nutrition is critical for overall health.

Ans : DELHI 2006

1. Definition: A balanced diet is one that provides all the essential nutrients in the right proportions to maintain optimal body function. It includes a variety of food groups such as fruits, vegetables, whole grains, proteins, and dairy, ensuring adequate intake

of carbohydrates, fats, proteins, vitamins, and minerals.

2. Importance: Proper nutrition is crucial for growth, repair, and energy production. It supports immune function, prevents chronic diseases, and enhances overall physical and mental well-being, which is essential for both everyday life and athletic performance.

- 114.** List two macro nutrients and two micro nutrients, along with their primary food sources and functions in the body.

Ans :

OD 2009

1. Macro Nutrients:
 - i. Carbohydrates: Found in whole grains, fruits, and vegetables; they provide the primary source of energy.
 - ii. Proteins: Found in meat, dairy products, legumes, and nuts; they are essential for muscle repair, growth, and overall tissue maintenance.
2. Micro Nutrients:
 - i. Vitamin C: Sourced from citrus fruits, strawberries, and bell peppers; it acts as an antioxidant and aids in collagen formation.
 - ii. Calcium: Found in dairy products, leafy greens, and fortified foods; it is crucial for bone health and muscle function.

- 115.** Differentiate between nutritive and non-nutritive components of the diet and provide examples of each.

Ans :

FOREIGN 2017

1. Nutritive Components: These are the substances in food that provide energy and support bodily functions. Examples: Proteins, carbohydrates, fats, vitamins, and minerals.
2. Non-Nutritive Components: These include substances that do not provide energy but may have health benefits or other roles. Examples: Fiber, phytochemicals, and water. Fiber aids in digestion and helps regulate blood sugar, while phytochemicals have antioxidant properties.

- 116.** Explain the concept of eating for weight control, including what constitutes a healthy weight and common pitfalls of dieting.

Ans :

SQP 2002

1. Healthy Weight: A healthy weight is one that is maintained by a balanced intake of

nutrients along with regular physical activity. It is not solely defined by numbers on a scale but also by body composition, metabolic health, and overall well-being.

2. Pitfalls of Dieting:
 - i. Restrictive Diets: Extremely low-calorie diets or elimination diets can lead to nutrient deficiencies, metabolic slowdown, and long-term health issues.
 - ii. Food Myths and Intolerances: Misconceptions about “superfoods” or the complete avoidance of food groups without medical advice can lead to imbalances. It is important to adopt sustainable eating habits rather than short-term restrictive diets.

- 117.** Discuss the importance of diet in sports performance, highlighting nutritional needs pre, during and post competition.

Ans :

COMP 2003

1. Pre-Competition:
 - i. Focus: Carbohydrate-rich meals to maximize glycogen stores and moderate protein intake.
 - ii. Purpose: To ensure the athlete has adequate energy levels and muscle readiness.
2. During Competition:
 - i. Focus: Easily digestible carbohydrates and fluids to maintain energy and hydration.
 - ii. Purpose: To sustain performance, delay fatigue, and replenish lost fluids.
3. Post-Competition:
 - i. Focus: A combination of proteins and carbohydrates.
 - ii. Purpose: To promote muscle recovery, replenish glycogen stores, and repair tissues.

NODIA

- 118.** What is a balanced diet? Describe its key components and why they are essential for an athlete.

Ans :

DELHI 2008

A balanced diet includes fruits, vegetables, whole grains, lean proteins, and healthy fats.

Essentials for an Athlete:

1. Energy Provision: Carbohydrates and fats supply the necessary fuel.
2. Muscle Repair and Growth: Proteins provide amino acids critical for recovery.

Ans :

2023

1. Vitamin D

- i. Functions : The main function of Vitamin D is to aid in the proper absorption of calcium and phosphorus. It is also essential for the deposition of these minerals into the bones, which is critical for maintaining healthy bones.
- ii. Sources : Dietary sources of Vitamin D include egg yolks, liver, fatty fish, and fortified foods. The human body can also synthesize Vitamin D when the skin is exposed to sunlight.

2. Vitamin K

- i. Function : The primary function of Vitamin K is that it is needed for proper blood clotting.
- ii. Sources : Vitamin K is found in green leafy vegetables, cabbage, and milk. It can also be produced by bacteria within the intestinal tract.

- 129.** Vitamins are essential for our energy levels and boost immune system. Comment.

Ans :

2020 C

Vitamins are vital for maintaining energy levels and strengthening the immune system. These organic compounds are required in small amounts to keep us healthy, and insufficient intake can lead to various deficiency diseases. They function primarily as helpers in many processes—for example, B-vitamins aid the digestive and nervous systems, vitamin K is crucial for blood clotting, and vitamin E protects cell membranes. Vitamins are classified into two groups: water-soluble and fat-soluble. Additionally, they play key roles in metabolizing fats and carbohydrates, maintaining healthy skin, and supporting red blood cell production.

- 130.** Discuss why protein is among the most important macronutrients.

Ans :

2020 C

Protein is one of the most critical macronutrients because it is an organic compound containing nitrogen, along with carbon, oxygen, and hydrogen. Protein molecules possess a complex structure, composed of nitrogen-containing amino acids. These amino acids join in chains to form various proteins found throughout the body. From hair and nails to muscles, skin, organs, and blood, as well as hormones and enzymes, protein

serves as a fundamental structural and functional component. It provides muscle structure and aids in repairing muscle tissue after exercise. In essence, proteins are the building blocks of the body, with nearly all lean (non-fat) tissue being made up of protein, which highlights its paramount importance.

- 131.** Briefly explain the functions and resources of three fat soluble vitamins.

Ans :

AI 2015

Fat-soluble vitamins—namely A, D, E, and K—are stored in body cells and are not eliminated as easily as water-soluble vitamins, which means excessive intake can lead to toxicity. Vitamin A is available from a wide range of foods such as carrots, pumpkin, winter squash, dark green leafy vegetables, and apricots, while vitamin D can be obtained from milk, other dairy products, and fish oil.

- 132.** What do you mean by food intolerance?

Ans :

AI 2017, Delhi 2016

Food intolerance refers to a person's inability to properly digest a specific food, which can lead to discomfort or adverse effects. This reaction is often triggered by certain chemicals in the diet or difficulties in digesting specific components. Additionally, additives such as preservatives, colorings, and flavorings—whether natural or artificial—can also cause food intolerance. Unlike food allergies, symptoms of food intolerance tend to appear more slowly. Often, individuals may tolerate a small or moderate amount of the food, but excessive or frequent consumption can provoke symptoms because their body is unable to handle larger quantities.

- 133.** What are the benefits of non-nutritive foods?

Ans :

2023-24

Non-nutritive foods are items that provide little or no nutritional energy (calories), but may offer other functional or health-related benefits. These include certain compounds or additives that influence flavor, preservation, or physiological health. Below are some common non-nutritive components and their benefits:

1. **Phytochemicals** : Phytochemicals are compounds produced by plants, typically to support their growth or to defend against competitors, predators, or pathogens. The term comes from the Greek word *phyton*,

- ii. Phytochemicals: Act as antioxidants, protecting cells from damage.
 - iii. Water: Essential for hydration, nutrient transport, and temperature regulation.
- Non-nutritive components work synergistically with nutritive ones to ensure that the body functions optimally and remains resilient against diseases.

124. Describe the pitfalls of rapid dieting for weight control and how it might affect an athlete's performance.

Ans :

OD 2013

Pitfalls of Rapid Dieting:

1. Nutrient Deficiencies: Extreme calorie restriction can result in a lack of essential nutrients, compromising energy levels and overall health.
2. Metabolic Slowdown: Rapid weight loss can cause the metabolism to slow down, making it harder to maintain a healthy weight in the long term.
3. Loss of Muscle Mass: Inadequate protein intake can lead to muscle loss, which negatively impacts strength and athletic performance.
4. Impact on Performance: These pitfalls can reduce endurance, impair recovery, and increase the risk of injuries, ultimately diminishing an athlete's competitive edge.

125. Explain the roles of macro nutrients in sports nutrition and identify common food sources for each.

Ans :

FOREIGN 2010

1. Carbohydrates:
 - i. Role: Serve as the primary fuel for high-intensity activities.
 - ii. Sources: Whole grains, fruits, and vegetables.
2. Proteins:
 - i. Role: Crucial for muscle repair, maintenance, and growth following physical activity.
 - ii. Sources: Lean meats, dairy products, legumes, and nuts.
3. Fats:
 - i. Role: Provide a long-lasting energy source and aid in the absorption of fat-soluble vitamins.
 - ii. Sources: Avocados, nuts, seeds, and fatty fish.

126. What are some common pitfalls of extreme dieting for weight control, and how can they adversely affect an athlete's performance and health?

Ans :

SQP 2019

Common Pitfalls:

1. Nutrient Deficiencies: Inadequate intake of essential vitamins and minerals can lead to fatigue and increased injury risk.
2. Muscle Loss: Extreme calorie restriction often results in loss of muscle mass, undermining strength and endurance.
3. Metabolic Disruption: Sudden drastic reductions in food intake can slow the metabolism, making long-term weight management more challenging.
4. Adverse Effects: These factors can impair recovery, reduce stamina, and negatively affect overall athletic performance.

127. Outline a nutrition plan tailored for sports performance that details dietary requirements before, during, and after competition.

Ans :

COMP 2014

1. Before Competition:
 - i. Plan: A carbohydrate-rich meal with lean protein and minimal fats, consumed about 3–4 hours prior to the event.
 - ii. Goal: To build energy reserves and ensure proper digestion before the competition.
2. During Competition:
 - i. Plan: Consumption of easily digestible carbohydrates and fluids—such as sports drinks or energy bars—to maintain hydration and energy levels.
 - ii. Goal: To prevent energy depletion and sustain performance throughout the event.
3. After Competition:
 - i. Plan: A recovery meal that combines proteins and carbohydrates within an hour after the event.
 - ii. Goal: To replenish glycogen stores, repair muscle tissues, and accelerate recovery.

THREE MARKS QUESTIONS

128. Write the functions of Vitamin D and Vitamin K and mention their sources.

3. Micronutrients: Vitamins and minerals support various metabolic processes and recovery.

A balanced diet ensures that athletes have the energy to train effectively and recover quickly after intense physical activity.

119. Discuss the role of proteins and fats as macro nutrients, including their food sources and functions in sports nutrition.

Ans :

OD 2006

1. Proteins:
 - i. Sources: Lean meats, dairy, legumes, and nuts.
 - ii. Functions: Essential for muscle repair, building, and recovery, proteins help in maintaining muscle mass and overall physical strength.
2. Fats:
 - i. Sources: Avocados, nuts, seeds, and oily fish.
 - ii. Functions: Provide a concentrated energy source, aid in the absorption of fat-soluble vitamins, and support hormone production, all of which are vital for endurance and recovery in sports.

120. Explain how improper dieting can lead to food intolerance and myths. Provide examples of common pitfalls.

Ans :

FOREIGN 2007

1. Food Intolerance: Overly restrictive diets can lead to deficiencies that may cause the body to react adversely to certain foods. For example, a lack of dietary fiber may disrupt gut flora, leading to intolerance issues.
2. Food Myths: Many diets are based on unproven claims such as “eliminating all carbs leads to weight loss” or “certain foods are inherently fattening.” These myths can result in imbalanced nutrition and unsustainable eating habits.
3. Common Pitfalls:
 - i. Over-Restriction: Cutting out entire food groups without proper substitutes can cause nutrient deficiencies.
 - ii. Fad Diets: Following trends without scientific backing may lead to short-term weight loss but long-term health problems.

121. Define a balanced diet and discuss its significance for maintaining energy levels in sports.

Ans :

SQP 2005

1. Definition: A balanced diet is one that includes a variety of food groups to supply the body with all essential nutrients in the right proportions.
2. Significance for Energy: For athletes, a balanced diet is vital as it provides consistent energy through carbohydrates, supports muscle repair with proteins, and ensures efficient metabolic functions through essential vitamins and minerals. This comprehensive nutrient intake is critical to sustain long training sessions and rapid recovery.

122. Compare two macro nutrients and two micro nutrients, highlighting their food sources and roles in enhancing sports performance.

Ans :

COMP 2011

1. Macro Nutrients:
 - i. Carbohydrates: Found in whole grains, fruits, and vegetables; they serve as the main energy source during high-intensity activities.
 - ii. Proteins : Found in lean meats, dairy, and legumes; they are essential for muscle repair, growth, and recovery post-exercise.
2. Micro Nutrients:
 - i. Iron : Sourced from red meat, beans, and fortified cereals; it is crucial for oxygen transport in the blood, enhancing endurance.
 - ii. Magnesium: Found in nuts, leafy greens, and whole grains; it supports muscle function and helps prevent cramps during prolonged activities.

123. What are nutritive components of a diet? Explain how non-nutritive components support overall health.

Ans :

DELHI 2012

1. Nutritive Components: These include macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins and minerals) that provide energy, facilitate growth, and repair tissues.
2. Non-Nutritive Components:
 - i. Fiber: Helps in digestion and maintaining a healthy gut microbiome.

meaning “plant.”

2. **Anthocyanins** : Anthocyanins are pigments that give grapes, blueberries, cranberries, and raspberries their dark hues.
3. **Flavonoids or Isoflavones** : Found in vegetables, fruits, and grains like soybeans and chickpeas, these compounds may exhibit mild estrogen-like effects.
4. **Artificial Sweeteners** : These synthetic compounds mimic the taste of sugar but provide fewer calories, making them common additives in diet foods and beverages.
5. **Preservatives** : Preservatives are substances that inhibit microbial growth, helping to extend the shelf life of food and drink products.
6. **Spices** : Spices are dried parts of plants—such as seeds, fruits, roots, bark, or vegetables—used primarily for flavoring, coloring, or preserving food.
7. **Coffee** : Coffee is a brewed beverage made from the roasted seeds of various coffee plant species.

134. What are carbohydrates? Differentiate between its types.

Ans :

2022-23

Carbohydrates are essential organic compounds made of carbon, hydrogen, and oxygen, serving as the body's main source of energy.

Types of Carbohydrates : Carbohydrates are classified into two main groups: simple and complex, based on their chemical structure.

Basis of Difference	Simple Carbohydrates (Sugars)	Complex Carbohydrates (Polysaccharides)
Structure	Made of one (monosaccharides) or two (disaccharides) sugar units.	Composed of long chains of more than two linked sugar units.
Taste	Generally sweet.	Typically not sweet.
Examples	Monosaccharides: Glucose, Fructose Disaccharides: Sucrose (table sugar), Lactose (milk sugar)	Starches, Dietary Fiber (Cellulose)
Food Sources	Fruits, milk, sweets, and commercially produced foods.	Whole grain cereals, rice, oats, potatoes, bread, legumes, and corn.

135. Define the concept of a balanced diet and explain its significance for athletes. How does a balanced diet support overall health and sports performance?

Ans :

A balanced diet is one that provides all the essential nutrients—carbohydrates, proteins, fats, vitamins, and minerals—in the right proportions to maintain optimal health and support daily activities. For athletes, a balanced diet is crucial because :

1. **Energy Provision**: Carbohydrates supply the primary energy required for high-intensity workouts and endurance events.
2. **Muscle Repair and Growth**: Proteins support muscle repair and development, which is vital after training and competition.
3. **Nutrient Absorption and Regulation**: Fats, vitamins, and minerals help in hormone production, energy storage, and recovery processes.

Overall, a balanced diet ensures that an athlete has the necessary fuel, supports recovery, and maintains long-term health, directly impacting performance on the field.

136. Discuss the roles of macro-nutrients and micro-nutrients in sports nutrition. Include examples of food sources and their primary functions.

Ans :

DELHI 2018

1. **Macro-nutrients**:
Carbohydrates:
 - i. **Function**: Primary source of energy for both anaerobic and aerobic activities.
 - ii. **Food Sources**: Whole grains, fruits, vegetables, and legumes.**Proteins**:
 - i. **Function**: Essential for muscle repair, recovery, and growth; also supports immune function.
 - ii. **Food Sources**: Lean meats, dairy products, beans, and nuts.**Fats**:
 - i. **Function**: Provide long-lasting energy, support cell structure, and aid in the absorption of fat-soluble vitamins.
 - ii. **Food Sources**: Avocados, olive oil, nuts, and fatty fish.
2. **Micro-nutrients**:
Vitamins and Minerals:
 - i. **Function**: Support various biochemical processes including energy production,

Ans :

COMP 2007

- (a) Macro-Nutrients and Energy:
- Carbohydrates: Provide rapid energy for high-intensity exercise, fueling both anaerobic and aerobic systems.
 - Fats: Serve as a dense, long-lasting energy source during prolonged activities when carbohydrate reserves are low.
 - Proteins: While primarily involved in repair and recovery, proteins can also serve as an energy source during extended, strenuous exercise when other fuels are depleted.
- (b) Micro-Nutrients in Recovery and Health:
- Vitamins: Aid in reducing oxidative stress and inflammation (e.g., vitamins C and E) while promoting tissue repair.
 - Minerals: Support muscle function, nerve transmission, and maintain electrolyte balance (e.g., magnesium, calcium, and potassium).

- 145.** What does a balanced diet mean for an athlete, and how does it differ from general dietary guidelines for non-athletes?

Ans :

DELHI 2008

A balanced diet for an athlete is specifically designed to meet high energy demands, promote muscle recovery, and support peak performance. Unlike general dietary guidelines, an athlete's diet typically includes:

- Higher Carbohydrate Intake: To fuel intense training and competition.
- Increased Protein: To facilitate muscle repair and growth.
- Targeted Hydration Strategies: To maintain electrolyte balance and prevent dehydration during prolonged physical activity.

This tailored approach ensures that athletes receive the nutrients necessary for both performance and recovery, which may differ in quantity and timing compared to a standard balanced diet.

- 146.** (a) What is meant by "eating for weight control" in the context of sports, and why is it essential for performance?
- (b) Discuss the potential risks associated with extreme dieting, including the impact of food intolerance and prevailing food myths.

Ans :

OD 2017

- (a) Eating for Weight Control : This concept involves managing energy intake to maintain

an ideal body composition that supports performance, agility, and endurance. It is essential for athletes as excessive weight can impair speed and stamina, while too little weight may lead to energy deficits and muscle loss.

- (b) Potential Risks of Extreme Dieting:
- Food Intolerance: Extreme restrictions can lead to nutritional deficiencies and digestive issues, undermining overall health and performance.
 - Food Myths: Reliance on unfounded dietary trends can result in inadequate energy intake or the elimination of beneficial food groups, negatively affecting recovery and performance.

- 147.** Explain the role of pre-, during, and post-competition nutrition in enhancing sports performance. How do specific dietary interventions at each stage contribute to an athlete's success?

Ans :

FOREIGN 2001

- Pre-Competition:
 - Focus: Maximizing energy reserves and ensuring hydration.
 - Intervention: A carbohydrate-rich meal paired with moderate protein consumption 3–4 hours before competition ensures that glycogen stores are full.
- During Competition:
 - Focus: Sustaining energy and preventing dehydration.
 - Intervention: Intake of easily digestible carbohydrates through sports drinks or gels maintains blood sugar levels and hydration.
- Post-Competition:
 - Focus: Accelerating recovery and muscle repair.
 - Intervention: A combination of proteins and carbohydrates within 30–60 minutes post-event helps replenish glycogen and supports muscle synthesis.

- 148.** What is a balanced diet? Explain its importance with reference to different food groups.

Ans :

SQP 2007

A balanced diet is one that contains various types of foods in such quantities and proportions that the need for calories, proteins, minerals, and other nutrients is adequately met. Its importance lies in ensuring holistic nourishment by including items

- ii. Fats: Offer a concentrated source of energy for prolonged, lower-intensity exercise.
- iii. Proteins: Although not a primary energy source, they contribute to energy production during extended periods of exercise when carbohydrate stores are low.

(b) Role of Micro-nutrients in Recovery and Immune Function:

- i. Vitamins: Such as vitamin C and E, help reduce oxidative stress and support tissue repair.
- ii. Minerals: Such as zinc and magnesium, play roles in muscle function, nerve transmission, and the maintenance of a strong immune system.

Together, these nutrients help repair cellular damage, reduce inflammation, and maintain overall health, which is essential for consistent training and performance.

- 141.** Define a balanced diet and discuss its importance in maintaining peak sports performance. How does each component of a balanced diet contribute to an athlete's needs?

Ans :

OD 2004

A balanced diet is one that provides the right amounts of carbohydrates, proteins, fats, vitamins, and minerals needed for optimal body function.

1. Carbohydrates: Fuel muscles during exercise and help sustain energy levels.
2. Proteins: Support muscle repair and growth, crucial after strenuous activity.
3. Fats: Serve as an essential energy source during extended periods of moderate activity and help with nutrient absorption.
4. Vitamins and Minerals: Ensure efficient metabolic processes, support immune function, and aid in recovery.

For athletes, a balanced diet not only sustains energy levels and enhances performance but also supports recovery and long-term health, making it a cornerstone of effective sports nutrition.

- 142.** Differentiate between nutritive and nonnutritive components of the diet. Why are both important for an athlete's overall diet?

Ans :

FOREIGN 2006

1. Nutritive Components:
 - i. Definition: Substances that provide essential energy and nutrients, such as

carbohydrates, proteins, fats, vitamins, and minerals.

- ii. Importance: They directly contribute to energy production, muscle repair, and overall body function.

2. Nonnutritive Components:

- i. Definition: Elements like dietary fiber, antioxidants, and phytochemicals that do not provide calories but offer additional health benefits.
- ii. Importance: They aid in digestion, reduce inflammation, and protect against chronic diseases.

For athletes, incorporating both nutritive and nonnutritive components ensures that the diet not only meets energy demands but also supports optimal health, recovery, and long-term performance.

- 143.** (a) Explain the concept of eating for weight control. Why is maintaining a healthy weight important for athletes?

- (b) Discuss common pitfalls of strict dieting, including food intolerance and food myths, and how they can negatively impact performance.

Ans :

SQP 2005

- (a) Eating for Weight Control : This involves tailoring food intake to meet energy needs while avoiding excess calories, ensuring that athletes maintain an optimal body weight for performance. Maintaining a healthy weight is critical as it affects agility, endurance, and overall physical efficiency during training and competition.

(b) Pitfalls of Strict Dieting :

- i. Food Intolerance: Overly restrictive diets may eliminate key food groups, leading to nutrient deficiencies and gastrointestinal discomfort.
- ii. Food Myths: Following unverified trends (e.g., extreme low-carb diets) may reduce energy levels and impair recovery.

Both issues can compromise performance, reduce training capacity, and hinder long-term health if not managed properly.

- 144.** (a) How do macro-nutrients directly influence energy levels during sports activities?

- (b) In what ways do micro-nutrients support recovery processes and overall health in athletes?

bone health, and immune function.

- ii. Food Sources: A wide variety of fruits, vegetables, dairy, and fortified cereals.

137. Differentiate between nutritive and nonnutritive components of a diet. Provide examples of each and discuss their respective roles in sports nutrition.

Ans :

FOREIGN 2003

1. Nutritive Components:
 - i. Definition: These are substances that provide energy and essential nutrients necessary for body functions.
 - ii. Examples: Carbohydrates, proteins, fats, vitamins, and minerals.
 - iii. Role in Sports Nutrition: They are critical for energy production, muscle repair, and overall metabolic processes that support athletic performance.
2. Nonnutritive Components:
 - i. Definition: Substances present in food that do not provide energy or essential nutrients but may have health benefits.
 - ii. Examples: Dietary fiber, antioxidants, and phytochemicals.
 - iii. Role in Sports Nutrition: They aid in digestion, reduce inflammation, and protect against oxidative stress, indirectly contributing to recovery and long-term health.

- 138.** (a) Describe the concept of “eating for weight control” and its significance for athletes.
- (b) Discuss the pitfalls of strict dieting, including food intolerance and food myths, in the context of sports nutrition.

Ans :

SQP 2006

- (a) Eating for Weight Control :This involves selecting a balanced, nutrient-dense diet that supports an athlete’s energy needs while maintaining an optimal body weight for performance. It includes proper portion control, timing of meals, and careful selection of food types to achieve a healthy balance without compromising energy levels or muscle mass.
- (b) Pitfalls of Strict Dieting:
- i. Food Intolerance: Overly restrictive diets may lead to the avoidance of foods that are important sources of nutrients, potentially causing imbalances or deficiencies.

- ii. Food Myths: Relying on unverified or popularized diet trends (e.g., eliminating entire food groups) can hinder performance, reduce energy availability, and lead to misinformation about optimal nutrition.

Both pitfalls emphasize the importance of individualized nutrition planning based on scientific guidelines rather than trends.

139. Explain the importance of diet in sports by discussing the pre, during, and post-competition nutritional requirements. How does diet influence performance and recovery?

Ans :

COMP 2009

1. Pre-Competition:
 - i. Objective: Maximize energy stores and optimize hydration before the event.
 - ii. Dietary Strategy: Focus on carbohydrate-rich meals to replenish glycogen stores, moderate protein for muscle support, and balanced hydration.
2. During Competition:
 - i. Objective: Maintain energy levels and delay fatigue.
 - ii. Dietary Strategy: Intake of easily digestible carbohydrates (such as sports drinks or energy gels) and fluids to sustain performance and prevent dehydration.
3. Post-Competition:
 - i. Objective: Accelerate recovery and repair muscle tissues.
 - ii. Dietary Strategy: Emphasize a combination of proteins for muscle repair and carbohydrates to restore depleted glycogen, along with fluids and electrolytes to rehydrate.

Overall, a well-planned diet ensures that athletes perform at their best during competition and recover quickly afterward, minimizing the risk of injuries and overtraining.

- 140.** (a) How do macro-nutrients contribute to energy production during sports activities?
- (b) In what ways can micro-nutrients support recovery and immune function in athletes?

Ans :

DELHI 2002

- (a) Role of Macro-nutrients in Energy Production:
- i. Carbohydrates: Provide quick and readily available energy, especially important during high-intensity activities.

from three major food groups:

1. **Energy-Giving Foods:** Cereals, fats, and sugars that provide carbohydrates and fats for fuel.
2. **Body-Building Foods:** Milk, meat, and pulses that supply protein essential for growth and tissue repair.
3. **Protective Foods:** Fruits and vegetables that provide vitamins and minerals crucial for metabolic functions and preventing disease.

Consuming a variety from these groups ensures all physiological needs are met, preventing both deficiencies and excesses.

- 149.** Explain the role and sources of carbohydrates as a macronutrient in an athlete's diet.

Ans :

COMP 2008

Carbohydrates are an athlete's main source of energy, providing 4 kcal per gram. Their primary role is to fuel the body, especially the nervous system, brain, and red blood cells. They are crucial for performance as they prevent the body from using protein for energy, thus "sparing" protein for its main function of tissue repair.

For athletes, carbohydrates should make up 55-70% of their caloric intake, depending on the sport, to ensure glycogen stores are full. Key sources include:

1. **Complex carbohydrates:** Whole grains, rice, oats, pasta, and potatoes are ideal pre-exercise foods.
2. **Simple carbohydrates:** Fruits and juices are good for quick energy replacement after exercise.

- 150.** Describe the functions and dietary sources of any three fat-soluble vitamins.

Ans :

DELHI 2010

Fat-soluble vitamins are stored in the body's cells and are vital for health.

1. **Vitamin A (Retinol):** It is essential for vision in dim light, healthy skin, immune system function, and the growth of skeletal tissues. Sources include milk, butter, egg yolk, and dark green, red, or yellow fruits and vegetables like carrots and mangoes.
2. **Vitamin D:** This vitamin is crucial for bone health as it is needed for the proper absorption and deposition of calcium and phosphorus. It is found in egg yolks, fatty fish, and fortified foods, and is also made by the skin when exposed to sunlight.

3. **Vitamin K:** Its primary function is to enable proper blood clotting. It is found in leafy green vegetables, cabbage, and milk, and is also produced by bacteria in the intestinal tract.

- 151.** What are non-nutritive components of diet? Explain the role of any two beneficial non-nutritive factors.

Ans :

OD 2012

Non-nutritive components are chemical compounds in foods that have no specific nutritional or energy value but can have various effects on the body. While some can interfere with nutrient absorption, others provide significant health benefits.

Two beneficial non-nutritive factors are:

1. **Phytochemicals:** These compounds are produced by plants and are found in fruits, vegetables, and grains. Many act as antioxidants, which protect cells from damage that could lead to cancer. Examples include carotenoids in carrots and flavonoids in green tea.
2. **Fibre (Roughage):** Although a type of carbohydrate, fibre is non-nutritive as it cannot be digested. It is crucial for providing a feeling of fullness, aiding in the smooth elimination of stool, and helping to prevent diseases like cancer, diabetes, and heart disease.

- 152.** What is Body Mass Index (BMI)? How is it used to classify different weight categories?

Ans :

FOREIGN 2005

Body Mass Index (BMI), also known as Quetelet's Index, is a key measure used to relate a person's weight to their height. It is calculated by dividing weight in kilograms by the square of the height in meters (kg/m^2). It is a widely used tool to categorize an individual's weight status, although it doesn't directly measure body fat percentage. BMI is used to classify weight categories as follows:

1. Below 18.5: Underweight
2. 18.5 to 24.9: Normal weight
3. 25.0 to 29.9: Overweight
4. 30.0 and above: Obesity

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muscle repair and overall growth. The current Recommended Daily Allowance (RDA) is 0.8 grams per kilogram of body weight per day, and consuming protein post-exercise supports muscle protein synthesis.

- (iv) Water : Water is vital for athletes. Fluid loss varies among individuals, so to prevent dehydration, athletes should drink approximately 5–7 mL per kilogram of body weight about four hours before an event. During competition, chilled water or electrolyte drinks should be consumed to replace sweat losses, as they are absorbed more quickly and help lower body temperature. Competing at high altitudes also increases water needs, and athletes should monitor the caffeine content in sports and energy drinks.
- (v) Vitamins : Maintaining adequate levels of vitamins and minerals is essential for proper body function and athletic performance. There is no evidence that consuming more vitamins than those obtained through a varied diet enhances performance. B vitamins such as thiamin, riboflavin, and niacin are necessary for converting food into energy, and foods rich in carbohydrates and proteins provide these vitamins.
- (vi) Minerals : Minerals are crucial for athletic performance. Sodium, which is lost through sweat, often needs to be replenished along with water during events. Although potassium is also lost during exercise, the decline is less significant, so consuming potassium-rich foods like oranges, bananas, and potatoes during and after exercise is important—especially for endurance athletes. Iron is particularly important for female athletes and those aged 13–19, who may have higher requirements due to menstruation and strenuous activity. Calcium, essential for bone health and muscle function, must be consumed in adequate amounts to prevent bone loss, with female athletes being at a higher risk of deficiency.

160. Vitamins are very essential for working of the body and are divided into two groups. Explain about them.

Ans :

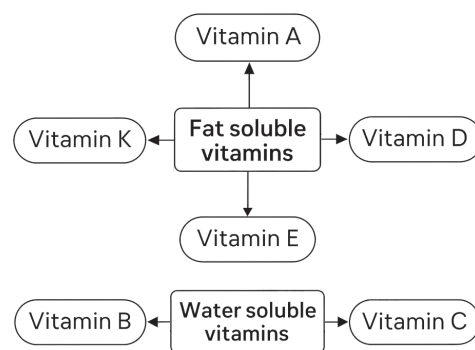
AI 2015

Vitamins are generally classified into two groups: water-soluble (B vitamins and vitamin C) and fat-soluble (vitamins A, D, E, and K).

1. Water-Soluble Vitamins : B vitamins are found in a wide range of foods and impact many

body functions. They serve as coenzymes, aiding in energy extraction from food, and are crucial for maintaining a healthy appetite, good vision, healthy skin, proper nervous system function, and red blood cell formation.

2. Fat-Soluble Vitamins : These vitamins are vital for normal bodily functions and require fats or lipids for absorption.
 - i. Vitamin K : Naturally produced by intestinal bacteria, vitamin K is essential for normal blood clotting, bone health, and the production of proteins needed for blood, bones, and kidneys. Excellent sources include green leafy vegetables such as turnip greens, spinach, cauliflower, cabbage, broccoli, and certain vegetable oils (soybean, cottonseed, canola, and olive oil).
 - ii. Vitamin A (Retinol) : Vitamin A is important for vision (helping the eyes adjust to light changes), bone growth, tooth development, reproduction, cell division, gene expression, and immune system regulation. It is abundant in foods like carrots, pumpkin, winter squash, dark green leafy vegetables, and apricots.
 - iii. Vitamin D : Vitamin D is crucial for the metabolism of calcium and phosphorus. It enhances calcium absorption in the small intestine, aiding in bone formation and maintenance. Good dietary sources include milk, other dairy products, and fish oil.



1. Discuss the requirement of food supplements in children's diets.

Ans :

2019 C

Requirement of Food Supplements in Children's Diets : Children need a balanced diet rich in vitamins. However, excessive intake of certain vitamins—especially fat-soluble ones like A and

FIVE MARKS QUESTIONS

- 157.** Define balanced diet. Explain any four micro nutrients.

Ans :

2020

A balanced diet provides all the essential nutrients in proper amounts for growth and body maintenance. Nutrients such as vitamins and minerals, although needed in small quantities (known as micronutrients), are equally crucial for health, each serving a specific function in the body.

1. **Vitamins :** Vitamins are compounds required in minute amounts for optimal bodily functions. They often act as helpers—for example, aiding in the metabolism of proteins, fats, and carbohydrates. Vitamins are classified into two groups:
2. **Water-Soluble Vitamins :** This group includes all the B vitamins and vitamin C. The body uses only what it needs; any excess is excreted through urine or stool. Because these vitamins are needed regularly in small doses, they are unlikely to become toxic.
3. **Fat-Soluble Vitamins :** This category comprises vitamins A, D, E, and K. These vitamins are stored in body cells and are not eliminated as readily as water-soluble vitamins, which increases the risk of toxicity if consumed in excess.
4. **Minerals :** Minerals are inorganic elements necessary for various physiological processes. They are divided into two groups:
 - i. **Macro-minerals:** Needed in larger amounts.
 - ii. **Micro-minerals (Trace Minerals):** Required in very small amounts. Although iron is classified as a trace mineral, it is needed in slightly larger quantities compared to other trace minerals.

- 158.** Explain macro-nutrients and their role in our diet.

Ans :

AI 2019

Macronutrients make up the bulk of our diet and include carbohydrates, fats, proteins, and water—each consumed in large amounts and essential for body function.

1. **Carbohydrates**
 - i. Serve as the primary fuel for muscle contractions.
 - ii. Provide energy to the body.

iii. Help maintain body weight and regulate temperature.

iv. Support various digestive processes.

2. **Fats :**

- i. Supply heat and energy.
- ii. Protect the body against extreme temperatures.
- iii. Aid in regulating body temperature.
- iv. Cushion internal organs.

3. **Proteins**

- i. Support physical and mental development.
- ii. Are essential for growth and tissue repair.
- iii. Contribute to the formation of enzymes and hormones, and serve as an energy source.
- iv. Aid in the transport of oxygen and nutrients.
- v. Help regulate water and acid balance in the body.

4. **Water**

- i. Facilitates the transport of nutrients to cells.
- ii. Helps regulate body temperature.
- iii. Is crucial for various chemical reactions.
- iv. Supports metabolism.
- v. Keeps the body properly hydrated.

- 159.** Diets for sportspersons are important. What should be the aims of preparing diet for sportsperson?

Ans :

Delhi 2015

An sportspersons balanced diet should be adjusted to match their training intensity.

- (i) **Carbohydrates :** These are a key energy source, but relying solely on high-carb intake can train the body to depend only on carbohydrates for fuel, rather than also utilizing fatty acids from fats.
- (ii) **Fats :** Fats play a significant role in meeting energy needs. During ultra-endurance events (6–10 hours), fats can supply 60–70% of energy requirements. In sports that involve extensive movement—like running, cycling, high jump, and gymnastics—a minimal fat intake is preferred, whereas sports such as sumo wrestling require higher fat levels. Generally, fats should make up at least 20% of total energy intake to maintain performance.
- (iii) **Proteins :** Proteins contribute less to immediate energy needs compared to carbohydrates and fats, but they are essential for tissue building and repair. The body primarily uses carbs and fats for energy, while proteins are crucial for

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- 153.** What are the major pitfalls of dieting for weight control as discussed in the textbook?

Ans :

SQP 2011

The primary issue is that very low-calorie diets are hard to sustain, often causing people to revert to old habits and regain weight quickly. A sudden, drastic calorie reduction can also trigger “starvation mode,” where the body’s metabolism slows down to conserve energy, making further weight loss difficult.

Additionally, fad diets that eliminate entire food groups like carbohydrates are impractical, unhealthy, and can lead to nutrient deficiencies. Many commercial diet programs and special meals are expensive and fail to provide a sustainable plan for long-term weight maintenance, proving ineffective for lasting results.

- 154.** What is food intolerance? Briefly explain how it differs from a food allergy and mention two common causes.

Ans :

COMP 2013

Food intolerance is a non-allergic food hypersensitivity where a person has difficulty digesting certain foods. The key difference from a food allergy is that intolerance does not involve an immune system response, while an allergy does. Intolerance symptoms, like bloating, also typically appear more slowly than the immediate reaction of an allergy.

Two common causes of food intolerance include:

1. Absence of an enzyme: The body may lack an enzyme needed for digestion, such as in lactose intolerance, where a deficiency of the lactase enzyme prevents the proper digestion of milk sugar.
 2. Chemical causes: Certain chemicals naturally present in foods, like caffeine in coffee or amines in some cheeses, can trigger intolerance reactions in susceptible individuals.
- 155.** (a) What are proteins and why are they considered ‘body-building’ foods?
- (b) Differentiate between complete and partially complete protein foods with examples.

Ans :

DELHI 2015

- (a) Proteins are complex organic compounds made of amino acids and are a major structural and functional component of our body. They are considered ‘body-building’ foods because their primary role is to build new cells and

repair existing tissues, which is essential for growth, development, and maintenance. They form parts of crucial structures like muscles, organs, skin, enzymes, and hormones.

- (b) The difference lies in their essential amino acid (EAA) content. Complete proteins contain all nine EAAs in adequate amounts for the body’s needs. They are considered high-quality proteins. Examples include eggs, milk, meat, and soybeans. Partially complete proteins are lacking in at least one EAA. For example, cereals lack lysine, while pulses lack methionine. Combining them, like in a meal of rice and dal, can form a complete protein.

- 156.** (a) Explain the importance of fluid and electrolyte replacement for an athlete.

- (b) What are the key nutritional goals for an athlete during the post-competition recovery phase?

Ans :

OD 2019

- (a) Fluid and electrolyte replacement is critical for an athlete because even slight dehydration can impair performance by causing mental and physical fatigue. During intense exercise, athletes lose significant amounts of fluids and essential electrolytes (like sodium and potassium) through sweat. Replacing these losses is crucial for maintaining normal body temperature, controlling blood sugar levels, and delaying fatigue. Proper hydration allows an athlete to sustain their performance for longer and prevents health risks associated with dehydration, such as rapid heart rate and confusion.
- (b) The key nutritional goals during the post-competition recovery phase are focused on restoring the body for the next training session or competition. The main objectives are:
- i. Replace Fluids: The athlete must rehydrate by drinking more fluid than was lost through sweat to restore normal fluid balance.
 - ii. Refill Carbohydrate Stores: Consuming high-carbohydrate foods immediately and within two hours after exercise is essential to replenish muscle and liver glycogen.
 - iii. Replace Electrolytes: Along with fluids, electrolytes like sodium and potassium lost during the event must be replaced to restore the body’s chemical balance.

D—can be harmful because they accumulate in the body and may cause illness. Similarly, taking high doses of minerals such as zinc and iron over time can lead to negative effects.

1. Iron Deficiency : Some young children experience iron deficiency, which can cause anemia—a condition that reduces the blood's ability to carry oxygen. Dietary insufficiency is often the culprit, as toddlers require at least 15 milligrams of iron daily, a target many fail to reach.
2. Too Much Milk : If a child consumes between 24 and 32 ounces (720–960 mL) of milk per day, it is generally safe. However, if milk intake significantly exceeds this amount and iron-rich foods are limited, consult a pediatrician about possibly adding an iron supplement. In the meantime, continue giving vitamin D drops (600 IU per day after age one) if milk consumption is below 32 ounces per day, and offer a variety of iron-rich foods to eventually eliminate the need for supplementation.

- 162.** Write briefly about minerals as an important nutritive component of food.

Ans :

Delhi 2016 C

Minerals : Minerals are a vital part of our diet. Essential minerals include iron, calcium, phosphorus, sodium, magnesium, potassium, zinc, and sulfur. Some minerals, needed only in trace amounts, are referred to as micro-minerals. Key points about mineral nutrition include:

1. Minerals are crucial for overall health.
2. They make up about 4% of our body weight.
3. They are necessary for maintaining healthy teeth, bones, and muscles.
4. They play an important role in transmitting nerve impulses, forming enzymes and hormones, and regulating blood pressure and heart rate.
5. A deficiency in any specific mineral can lead to deficiency diseases.

Some of the important minerals and their uses are as follows :

Calcium	Needed for muscle and heart functions. Helps in blood clotting, regulated blood pressure, builds bone deficiency, can cause rickets
Iron	Required for, formation of hemoglobin. Deficiency causes anemia

Zinc	Required for several enzymes. For normal taste and smell, liver function etc.
Copper	Required component of many enzymes, and blood formation
Iodine	Synthesis of thyroid hormones. Deficiency, causes goiter and mental retardation

- 163.** Enlist the nutritive and non-nutritive components of diet and write about any two nutritive components in detail.

or

What are the Nutritive and Non-nutritive components of diet? Explain.

Ans :

2021 CAI 2017

The two essential components of a diet are:

1. Nutritive Components of the Diet : These are the nutrients that provide essential nutrition and include carbohydrates, proteins, fats, vitamins, and minerals. They can be further divided into:
 - i. Macro-nutrients : These nutrients are needed in large amounts because they serve as the building blocks for growth and maintenance. They include fats, proteins, and carbohydrates.
 - ii. Micro-nutrients : Required in very small amounts, micro-nutrients are crucial for normal body functions. They facilitate various chemical reactions in the body and include vitamins and minerals.
2. Non-Nutritive Components of the Diet : Non-nutritive compounds, although they do not provide nutrition directly, are important for other reasons. These include roughage (fiber), water, color, and flavor. Their roles include:
 - i. Water: Provides the right texture for food and is essential for cooking.
 - ii. Colors: Enhance the visual appeal of food.
 - iii. Flavors: Improve the taste of food.
 - iv. Roughage: Aids in moving food through the digestive tract and supports the synthesis of certain nutrients in the large intestine.

- 164.** What do you understand by food myths?

or

What do you understand by Food Myths? Discuss briefly about various Food Myths.

Ans :

Delhi 2019, 2016,

Myths are widely held but false beliefs or ideas. Various food myths exist in India and around the world. Here are a few examples:

1. Myth: Drinking water while eating makes you fat.

Fact: Drinking water during a meal does not cause weight gain. In fact, water can help digestion by breaking down food and softening stool to prevent constipation. Drinking water before meals can also help fill the stomach, reducing the likelihood of overeating. There is no evidence that water dilutes digestive juices or impairs digestion—instead, it aids in nutrient absorption.

2. Myth: Drinking milk immediately after eating fish leads to white patches on the skin.

Fact: While consuming milk after eating a very spicy fish dish (excessive chillies) may cause indigestion or acid reflux, there is no evidence to suggest that it causes white patches on the skin. Milk or cream-based fish preparations have not been linked to such side effects.

3. Myth: Exercise makes you eat more and causes weight gain.

Fact: Exercise burns calories, which can increase appetite, but it also encourages the consumption of more nutritious foods. Studies have shown that active individuals do not necessarily consume more calories than those who are sedentary, and regular exercise supports a healthy energy balance without leading to fat gain.

165. What are the pitfalls of dieting?

Ans :

2020

- (i) Skipping meals : Although reducing food intake might seem logical for weight loss—since less food means fewer calories to metabolize—in reality, skipping meals causes the body to lower its metabolic rate as a natural response to perceived food scarcity. This, in turn, undermines weight loss efforts.
- (ii) Intake of calories through drinking : When trying to lose weight, people often focus on the calories in solid foods while overlooking the significant calorie contributions from drinks. Beverages like coffee with cream and sugar, sweetened juices, and sodas can add a substantial amount of calories, leading to weight gain.

- (iii) Underestimating the calories : Many dieters tend to underestimate the total number of calories they consume, both from food and drinks. Being more mindful of all calorie sources is essential for effective weight management.
- (iv) Intake of labelled foods : Claims about low-calorie or fat-free products are often misleading. People may overeat these items under the impression that they are healthier, which can result in consuming more calories than intended.

166. Briefly explain the following:

- (i) Vitamins
- (ii) A healthy weight
- (iii) The pitfalls of dieting
- (iv) Food intolerance
- (v) Food Myths

Ans :

2021 C

The following terms are defined as follows:

- (i) Vitamins : Vitamins are essential chemicals required in small amounts for proper body function. They primarily act as helpers in various processes, such as B vitamins aiding digestion and the nervous system, vitamin K supporting blood clotting, and vitamin E protecting cell walls. Vitamins are classified into two types: water-soluble and fat-soluble.
- (ii) Healthy Weight : A healthy weight is the body weight that reduces the risk of health conditions like heart disease and bone disorders. Body Mass Index (BMI) is a key indicator, with a healthy BMI ranging from 19 to 25. A BMI between 25 and 29 classifies a person as overweight, while a BMI of 30 or more indicates obesity.
- (iii) Pitfalls of Dieting : A pitfall refers to a problem or disadvantage in a situation. Dieting often lacks essential nutrients, leading to both physical and mental health issues. Scientific studies confirm that restrictive dieting can have negative consequences rather than providing long-term health benefits.
- (iv) Food Intolerance : Food intolerance refers to difficulty digesting certain foods, unlike food allergies, which involve an immune system response. Symptoms of intolerance appear more gradually and often cause digestive discomfort. Common triggers include dairy, gluten-containing grains, and gas-producing foods such as beans and cabbage.

- (v) **Food Myths** : A food myth is a misconception or false belief about food, often leading people to follow misleading dietary trends. These myths may discourage the consumption of nutritious foods based on incorrect assumptions. For example, a common myth suggests that drinking milk after eating fish causes white patches on the skin, yet many traditional dishes combine fish with curd, a dairy product. Another myth is that potatoes cause weight gain, whereas in reality, they are a nutritious and affordable carbohydrate source when consumed in moderation.

167. What do you mean by 'Healthy-Weight'? Explain the methods to control 'Healthy Body Weight to lead healthful-living'.

Ans :

Delhi 2017

A healthy weight is one that reduces the risk of health issues such as heart disease, high blood pressure, and diabetes. Body Mass Index (BMI) and weight-to-height charts are effective tools for determining whether a person has a healthy weight.

Another way of judging a person's health is to calculate the BMI.

Method to calculate healthy weight-

	Category	BMI
$\text{BMI} = \frac{\text{Weight(kg)}}{(\text{Height in metres})^2}$ $\text{BMI} = \frac{703 \times \text{Weight(lb)}}{(\text{Height in inches})^2}$	Under weight	Less than 18.5
	Normal weight	18.5 to 24.5
	Over weight	25 to 29.9
	Obesity Class I	30 to 34.9
	Obesity Class II	35 to 39.9
	Obesity Class III	More than 40

Methods to Control healthy body weight

- Set Realistic Goals:** Establish weight goals based on BMI calculations, focusing on overall health rather than just weight loss. Plan physical activities according to available resources.
- Maintain a Balanced Diet:** Opt for locally available nutritious foods and drink plenty of water to stay hydrated.
- Increase Fiber Intake & Avoid Skipping Meals:** Consume more fiber-rich foods and reduce

calorie intake from nutrient-poor foods.

- Adopt an Active Lifestyle:** Stay engaged in daily activities and seek support from family and friends.
- Practice Yoga:** Regular yoga improves physical health and mental well-being by reducing stress.
- Avoid Harmful Substances:** Stay away from alcohol, drugs, and smoking.
- Engage in Regular Exercise:** Maintain a balance between calorie intake and expenditure through physical activity.
- Get Regular Medical Check-ups:** Routine health screenings help monitor and manage weight-related health risks.

168. Discuss about meal intake guidelines, for pre, during and post sports event.

Ans :

2019

Balanced Diet for a Sports person : For athletes, maintaining a balanced diet is crucial due to the high levels of physical activity and endurance required in sports.

- Nutrition Before Competition :** At least a week before the event, athletes should consume complex carbohydrates to increase glycogen storage, which serves as the primary fuel for muscles. Meals 3–4 days before the competition should be carbohydrate-rich while being low in fat and protein. The diet should be tailored to the intensity of the sport. About two hours before the competition, a high-carbohydrate energy drink can provide sufficient fuel.
- Nutrition During Competition :** Staying hydrated and maintaining stable blood sugar levels are essential to prevent fatigue. If the competition lasts over 60 minutes, consuming $\frac{1}{2}$ to 1 cup of a carbohydrate-based drink every 10–20 minutes is recommended. For events lasting less than 60 minutes, a carbohydrate drink can be taken every 20–30 minutes.
- Nutrition After Competition :** Post-competition recovery is crucial. Rehydration should be the priority, which can be achieved by drinking water or electrolyte replacement drinks. A meal should be consumed within two hours of the event for optimal recovery. For effective glycogen replenishment, 100–200 grams of carbohydrates should be paired with lean protein sources like meat or chicken. At least 20 grams of protein is necessary to aid in muscle repair, maintenance, and recovery.

177. In reference to the picture answer the following questions :



- (i) Which natural pigment primarily gives red cabbage and eggplant their characteristic color?
- (a) Chlorophyll
 - (b) Anthocyanin
 - (c) Beta-carotene
 - (d) Lycopene

Ans :

- (b) Anthocyanin
- (ii) Red cabbage is a good source of:
- (a) Vitamin C and dietary fiber
 - (b) High amounts of sugar
 - (c) Only carbohydrates
 - (d) Zero nutritional value

Ans :

- (a) Vitamin C and dietary fiber
- (iii) Eggplant is botanically classified as a:
- (a) Root vegetable
 - (b) Leafy vegetable
 - (c) Berry (fruit)
 - (d) Seed

Ans :

- (c) Berry (fruit)
- (iv) Which part of these plants is typically consumed as food?
- (a) Seeds only
 - (b) Leaves and flowers only
 - (c) Edible roots only
 - (d) The mature fruit or head (for cabbage)

Ans :

- (d) The mature fruit or head (for cabbage)

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enhance metabolism.

- ii. Sources: Fruits, vegetables, dairy products, meat, and fortified cereals.
- iii. Importance: Vitamins like A, C, and D support vision, immunity, and bone health, while minerals like iron, calcium, and zinc are essential for oxygen transport, bone strength, and immune response.

Non-Nutritive Components of the Diet : Non-nutritive components do not directly contribute to energy production, but they play a significant role in improving digestion, preventing diseases, and enhancing longevity.

1. Dietary Fiber

- i. Function: Aids digestion, prevents constipation, and helps regulate blood sugar levels.
- ii. Sources: Whole grains, legumes, fruits, and vegetables.
- iii. Importance: Reduces the risk of heart disease and supports healthy gut bacteria.

2. Water

- i. Function: Essential for hydration, digestion, circulation, and temperature regulation.
- ii. Sources: Drinking water, fruits (watermelon, oranges), and vegetables (cucumbers, celery).
- iii. Importance: Prevents dehydration, improves brain function, and flushes out toxins.

3. Antioxidants

- i. Function: Neutralize harmful free radicals in the body, reducing cell damage.
- ii. Sources: Green tea, berries, dark chocolate, and leafy greens.
- iii. Importance: Helps prevent cancer, heart disease, and premature aging.

4. Probiotics

- i. Function: Promote the growth of healthy gut bacteria and aid digestion.
- ii. Sources: Yogurt, kefir, kimchi, and fermented foods.
- iii. Importance: Improves gut health, boosts immunity, and enhances nutrient absorption.

5. Flavonoids & Phytochemicals

- i. Function: Reduce inflammation, lower cholesterol, and support heart health.
- ii. Sources: Citrus fruits, dark chocolate, and herbal teas.
- iii. Importance: Protects against chronic

diseases like diabetes and hypertension.

- 171.** What are the key factors in maintaining a healthy weight? Explain the pitfalls of dieting and common food myths.

Ans :

DELHI 2016

Maintaining a healthy weight involves a combination of proper nutrition, regular exercise, and a balanced lifestyle. It is not only about weight loss or gain but also about achieving a sustainable and healthy body composition.

Key Factors in Maintaining a Healthy Weight

1. Balanced Diet:

- i. Eating a variety of nutrient-rich foods from all food groups.
- ii. Avoiding excessive processed foods, sugary drinks, and trans fats.
- iii. Consuming adequate protein and fiber to keep hunger levels in check.

2. Regular Physical Activity:

- i. Engaging in at least 30-60 minutes of exercise daily (cardio, strength training, flexibility exercises).
- ii. Improving metabolism and muscle mass to sustain energy expenditure.

3. Portion Control:

- i. Monitoring food intake to avoid overeating, even with healthy foods.
- ii. Using smaller plates, reading food labels, and mindful eating techniques.

4. Hydration:

- i. Drinking sufficient water to prevent dehydration and unnecessary snacking.
- ii. Water helps in digestion, metabolism, and temperature regulation.

5. Adequate Sleep:

- i. Poor sleep affects hunger hormones, leading to overeating.
- ii. Ensuring 7-9 hours of quality sleep improves weight management.

Pitfalls of Dieting : Many people adopt extreme diets that may offer short-term weight loss but cause long-term health issues.

1. Crash Diets:

- i. Leads to muscle loss and nutritional deficiencies.
- ii. Causes fatigue, irritability, and a slowed metabolism.

2. Eliminating Entire Food Groups:

- i. Avoiding carbs or fats entirely can result in energy imbalances.
- ii. Can lead to deficiencies in essential nutrients.

169. What is a balanced diet? Explain its importance and components in maintaining overall health.

Ans :

SQP 2019

A balanced diet is one that provides the body with all essential nutrients—carbohydrates, proteins, fats, vitamins, minerals, fiber, and water—in the correct proportions to maintain optimal health and bodily functions. It plays a crucial role in supporting growth, energy production, immune function, and disease prevention.

1. Importance of a Balanced Diet : A balanced diet is vital for individuals of all ages, particularly for growing children, athletes, and elderly individuals. Some key benefits include:
 - i. Supports Growth & Development: Essential for physical and cognitive development, particularly in children and adolescents.
 - ii. Enhances Energy Levels: Provides the necessary fuel for day-to-day activities, work, and exercise.
 - iii. Strengthens Immunity: Provides essential vitamins and minerals that help the body fight infections and diseases.
 - iv. Promotes Digestive Health: Includes fiber-rich foods that aid digestion and prevent constipation.
 - v. Prevents Chronic Diseases: Reduces the risk of obesity, diabetes, heart disease, and high blood pressure.
 - vi. Boosts Mental Well-being: Proper nutrition supports brain function, improves concentration, and enhances mood.
2. Components of a Balanced Diet
 - i. Carbohydrates (50-60%) – The primary source of energy, found in whole grains, fruits, vegetables, and legumes. Complex carbohydrates provide sustained energy and prevent blood sugar spikes.
 - ii. Proteins (10-15%) – Essential for tissue repair, muscle building, and enzyme production. Sources include eggs, fish, dairy, meat, lentils, and tofu.
 - iii. Fats (20-30%) – Important for brain function, energy storage, and cell membrane integrity. Healthy fats come from nuts, seeds, avocados, and olive oil.
 - iv. Vitamins & Minerals – Required in small quantities for metabolic processes, immunity, and bone health. Sources

include fruits, vegetables, dairy products, and nuts.

- v. Fiber – Aids digestion and prevents constipation. Found in whole grains, vegetables, and legumes.
- vi. Water – Crucial for hydration, digestion, and temperature regulation. At least 8-10 glasses should be consumed daily.

170. Discuss the nutritive and non-nutritive components of the diet. Why are non-nutritive components important?

Ans :

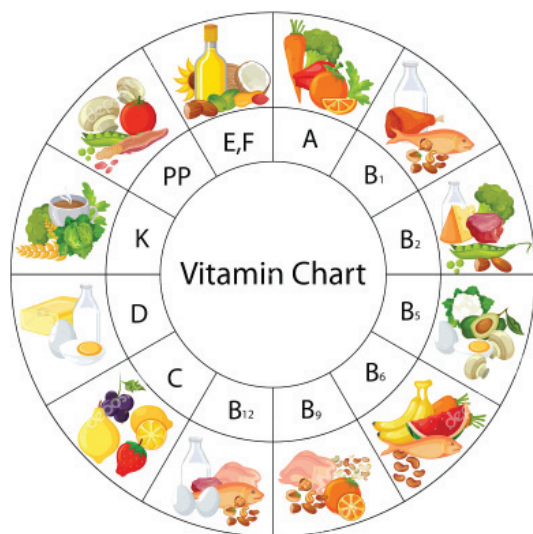
COMP 2014

A well-balanced diet consists of both nutritive and non-nutritive components, each playing a crucial role in maintaining overall health. While nutritive components provide essential energy and nutrients required for growth, repair, and bodily functions, non-nutritive components aid digestion, enhance immunity, and help prevent chronic diseases.

Nutritive Components of the Diet : Nutritive components include macronutrients and micronutrients, which directly contribute to the body's energy supply and overall well-being.

1. Carbohydrates (50-60%)
 - i. Function: Serve as the body's primary source of energy, especially for the brain and muscles.
 - ii. Sources: Whole grains (wheat, rice, oats), fruits, vegetables, and dairy products.
 - iii. Importance: Provides glucose for energy production and helps sustain stamina in physical activities.
2. Proteins (10-15%)
 - i. Function: Essential for muscle repair, enzyme production, and immune function.
 - ii. Sources: Meat, fish, eggs, dairy products, legumes, soy, and nuts.
 - iii. Importance: Helps build new cells, repair tissues, and produce essential hormones and enzymes.
3. Fats (20-30%)
 - i. Function: Provide long-term energy, support brain function, and help in the absorption of fat-soluble vitamins.
 - ii. Sources: Nuts, seeds, avocados, olive oil, and fatty fish.
 - iii. Importance: Protects organs, helps regulate body temperature, and supports cellular function.
4. Vitamins and Minerals
 - i. Function: Regulate body functions, strengthen the immune system, and

174. In reference to the picture answer the following questions

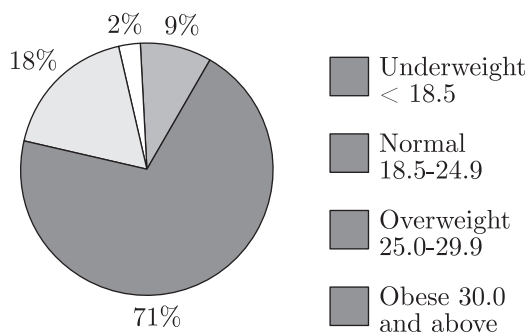


- What is the other name of Vitamin B1?
- Deficiencies of B9 can cause _____.
- Vitamin _____ helps in maintaining hair colour

Ans :

- The other name of Vitamin B1 is Thiamine.
- Deficiencies of Vitamin B9 (Folic Acid) can cause megaloblastic anemia (and in pregnancy can lead to neural tube defects).
- Vitamin B6 (Pyridoxine) helps in maintaining hair color (by supporting melanin production).

175. Based on the above pie chart



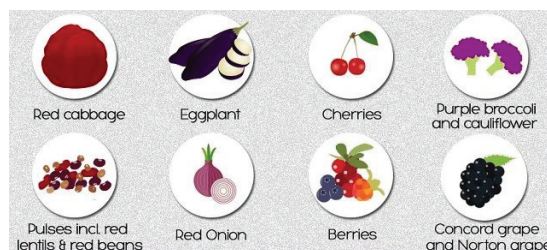
- The major category of students fall in _____
- Which category is overweight?
- 25-29.9 is _____ category.

Ans :

- The major category of students fall in the Normal range (18.5-24.9).

- The category labeled as Overweight is for BMI values 25.0-29.9.
- 25-29.9 is the Overweight category.

176. In reference to the picture answer the following questions :



- The vibrant purple/red color in foods like red cabbage, eggplant, and berries is primarily due to which natural pigment?
 - Chlorophyll
 - Anthocyanin
 - Beta-carotene
 - Lycopene
- Which of the following foods from the image is actually classified as a legume?
 - Eggplant
 - Cherries
 - Pulses (lentils and beans)
 - Purple broccoli

Ans :

- Pulses (lentils and beans)
- Which of these foods is widely recognized as a fruit (botanically speaking), even though many people consider it a vegetable?
 - Red onion
 - Eggplant
 - Purple cauliflower
 - Red cabbage

Ans :

- Eggplant
- Consuming anthocyanin-rich foods (such as those shown) may help support:
 - Excessive sugar intake
 - Increased blood pressure
 - Eye health and overall antioxidant activity
 - Weakened immune response

Ans :

- Eye health and overall antioxidant activity

3. Extreme Caloric Restriction:
 - i. Low-calorie diets slow metabolism and increase cravings.
 - ii. Can lead to binge eating and poor mental health.

Common Food Myths

- i. "Carbs make you fat." Whole grains and complex carbohydrates are essential for energy.
- ii. "Skipping meals helps in weight loss." Skipping meals slows metabolism and increases cravings.
- iii. "Fat-free foods are always healthy." Many fat-free products contain added sugars and preservatives.

- 172.** Why is diet important in sports? Explain pre-, during-, and post-competition dietary requirements.

Ans :

OD 2018

A well-balanced diet is crucial for athletes to perform at their best, improve endurance, recover efficiently, and prevent injuries. Proper nutrition provides the necessary fuel for training, competition, and recovery.

1. Why is Diet Important in Sports?
 - i. Energy Production: Provides essential macronutrients for endurance and strength.
 - ii. Muscle Growth & Repair: Proteins aid in muscle recovery and tissue repair.
 - iii. Hydration & Electrolyte Balance: Prevents dehydration and muscle cramps.
 - iv. Optimized Recovery: Ensures glycogen replenishment and muscle protein synthesis.
2. Pre-Competition Diet
 - i. Carbohydrates: Provide stored energy (pasta, rice, oats, fruits).
 - ii. Proteins: Prevent muscle breakdown (chicken, yogurt, eggs).
 - iii. Hydration: Drink plenty of water or electrolyte-rich fluids.
 - iv. Avoid Fatty & Heavy Foods: Prevents sluggishness and digestion issues.
3. During-Competition Diet
 - i. Short-Duration Events (<1 hour): Water for hydration.
 - ii. Long-Duration Events (>1 hour): Energy gels, bananas, or sports drinks to replenish glucose levels.

- iii. Electrolyte Replacement: Prevents cramps (sports drinks, coconut water).
4. Post-Competition Diet
 - i. Carbohydrates: Restore glycogen levels (whole grains, sweet potatoes).
 - ii. Proteins: Help muscle recovery (lean meats, protein shakes).
 - iii. Electrolytes & Minerals: Replenish sodium, potassium, and magnesium (bananas, nuts).
 - iv. Rehydration: Drinking sufficient water or electrolyte-rich drinks.

CASE BASED QUESTION

- 173.** Sunita is a state level Judo player, who reduces her diet to control her weight. Her coach advised her about pitfalls of dieting and recommended her to take sufficient amount of simple carbohydrates, fats, proteins, vitamins and minerals. Based on this case, answer the following questions.

- (i) Glucose, fructose and lactose are _____.
 - (a) Simple carbohydrates
 - (b) Complex carbohydrates
 - (c) Vitamins
 - (d) Minerals
- (ii) _____ are known as body building foods.
 - (a) Carbohydrates
 - (b) Fats
 - (c) Proteins
 - (d) Minerals
- (iii) Following are pitfalls of dieting, except
 - (a) Loss of weight
 - (b) Anemia
 - (c) Loss of energy
 - (d) Healthy weight.

Ans :

2021 C

- (i) (a) Simple carbohydrates
- (ii) (c) Proteins
- (iii) (d) Healthy weight

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CHAPTER 6

TEST AND MEASUREMENT IN SPORTS

SUMMARY

1. FITNESS TESTS – SAI KHELO INDIA FITNESS TEST (SCHOOL LEVEL)

The SAI Khelo India Fitness Test is a national initiative aimed at promoting physical fitness among school children. This test is designed to evaluate various aspects of physical health and performance, such as endurance, strength, flexibility, balance, and overall body composition. The test is tailored to different age groups to ensure that assessments are age-appropriate and provide meaningful insights into the physical development of students.

1.1 Age Group 5-8 Years (Class 1-3)

For younger children, the focus is on simple tests that evaluate basic motor skills, balance, and body composition. These tests serve as an early indicator of overall physical fitness and encourage young children to engage in physical activities.

1. **BMI (Body Mass Index):** BMI is calculated by dividing the weight (in kilograms) by the square of the height (in meters). This metric helps determine whether a child is underweight, normal weight, overweight, or obese. It provides a quick snapshot of the child's body composition relative to their age and growth pattern.
2. **Flamingo Balance Test:** This test assesses a child's ability to maintain balance by having them stand on one leg for a specified period. It evaluates static balance, coordination, and neuromuscular control, which are critical at this stage of motor development.
3. **Plate Tapping Test:** The plate tapping test measures speed, reaction time, and hand-eye coordination. Children are required to tap two plates alternately as quickly as possible, which helps in assessing their dexterity and response time.

1.2 Age Group 9-18 Years (Class 4-12)

For older children and adolescents, the fitness tests become more comprehensive and demand higher levels of physical exertion. These tests are designed to evaluate various components such as cardiovascular endurance, muscular strength, flexibility, and overall athletic ability.

1. **BMI (Body Mass Index) :** Continued monitoring of BMI remains essential as children grow. This helps in tracking changes in body composition over time and provides insights into whether the child's growth is on a healthy trajectory.
2. **50 m Speed Test:** This test measures the time taken to cover a 50-meter distance, providing a direct assessment of sprinting speed and acceleration. It is crucial for sports that require quick bursts of speed and agility.
3. **600 m Run/Walk:** The 600-meter run/walk test is a measure of cardiovascular endurance and stamina. It assesses how efficiently the cardiovascular system delivers oxygen to the muscles during sustained physical activity. The results of this test help identify potential areas for improvement in aerobic capacity.
4. **Sit & Reach Flexibility Test:** This flexibility test focuses on the lower back and hamstring muscles. Participants are required to sit on the floor with legs extended and reach forward as far as possible. Flexibility is a key component of overall physical fitness, and this test helps in identifying potential muscle tightness or imbalances.
5. **Strength Tests:** These tests evaluate different aspects of muscular strength and endurance:
 - (i) **Partial Abdominal Curl-Up:** This test assesses core strength and endurance by counting the number of curl-ups performed in a given period. A strong core is essential for overall stability and athletic performance.
 - (ii) **Push-Ups (for boys) and Modified Push-Ups (for girls) :** Upper body strength is

measured by the number of push-ups a participant can perform. Modifications are made for girls to accommodate varying physical development and ensure fairness in assessment.

2. MEASUREMENT OF CARDIOVASCULAR FITNESS – HARVARD STEP TEST

Cardiovascular fitness, or aerobic endurance, is a fundamental component of physical fitness. The Harvard Step Test is a well-established method used to measure the efficiency of the cardiovascular system, specifically the heart and lungs, in delivering oxygen during sustained physical activity.

2.1 Test Procedure

Participants are required to step up and down on a standardized platform at a predetermined pace for a specific duration, usually until exhaustion or for a set time period. Immediately after the exercise, the individual's pulse is measured, and the recovery rate is recorded.

2.2 Scoring and Interpretation

The performance in the Harvard Step Test is quantified using the following formula:

Fitness Index

$$= \frac{\text{Duration of Exercise (in seconds)} \times 100}{5.5 \times \text{Pulse count after 1-1.5 minutes}}$$

A higher fitness index indicates a higher level of cardiovascular endurance, meaning that the individual's heart and lungs are effectively working together to deliver oxygen to the body during physical exertion. This test is invaluable for athletes and fitness enthusiasts as it highlights aerobic capacity and helps in tailoring endurance training programs.

3. BASAL METABOLIC RATE (BMR) CALCULATION

Basal Metabolic Rate (BMR) is a critical measurement in sports nutrition and fitness planning. BMR represents the minimum number of calories the body requires at rest to sustain vital functions such as breathing, circulation, cell production, nutrient processing, and temperature regulation.

3.1 Importance of BMR in Sports and Health

1. **Energy Balance:** Knowing one's BMR is essential for understanding overall energy expenditure. It helps in designing diets

that match energy needs, preventing both undernutrition and overnutrition.

2. **Weight Management:** For athletes, maintaining an optimal weight is crucial for performance. BMR calculations assist in determining the correct caloric intake required for weight maintenance, weight loss, or weight gain.
3. **Personalized Nutrition Plans:** BMR serves as a foundation for creating personalized diet plans. Adjustments in macronutrient distribution can be made based on the BMR to meet specific athletic performance goals.

Calculating BMR involves factors such as age, gender, weight, and height. This metric is then used alongside other activity-related factors to determine total daily energy expenditure (TDEE).

4. RIKLI & JONES SENIOR CITIZEN FITNESS TEST

As individuals age, maintaining physical fitness becomes increasingly important to ensure independence, mobility, and overall quality of life. The Rikli & Jones Senior Citizen Fitness Test is specifically designed to evaluate the physical capabilities of older adults, focusing on strength, flexibility, balance, agility, and aerobic endurance.

4.1 Test Components and Their Significance

1. **Chair Stand Test:** This test measures lower body strength by counting the number of times a person can rise from a seated position within a specified time period. It is crucial for assessing the strength required for daily activities such as standing up and walking.
2. **Arm Curl Test:** The arm curl test evaluates upper body strength. Participants perform bicep curls using a light dumbbell, and the number of repetitions completed in a given time period is recorded. This test is important for activities that involve lifting or carrying objects.
3. **Chair Sit & Reach Test:** This test measures the flexibility of the lower body, especially the hamstrings and lower back. Flexibility is essential for preventing injuries and maintaining a good range of motion.
4. **Back Scratch Test:** The back scratch test assesses upper body flexibility by measuring the distance between the hands when reaching over the shoulder and up the back. This test is indicative of shoulder joint mobility.
5. **Eight-Foot Up & Go Test:** This test measures agility and balance by timing how quickly a

person can rise from a seated position, walk around a marker placed eight feet away, and return to the seat. It is a strong predictor of fall risk in older adults.

6. Six-Minute Walk Test: This aerobic endurance test measures the distance an individual can walk in six minutes. It is a key indicator of cardiovascular fitness and overall endurance in senior citizens.

Collectively, these tests provide a comprehensive assessment of the functional fitness of older adults, helping to identify areas that may need improvement and guiding interventions to maintain independence and mobility.

5. JOHNSEN-METHNEY TEST OF MOTOR EDUCABILITY

Motor coordination and the ability to execute physical movements efficiently are fundamental aspects of athletic performance and physical education. The Johnsen–Methney Test of Motor Educability is used to evaluate an individual's motor skills, which are critical for both everyday activities and sports performance.

5.1 Components of the Test

1. Front Roll: This component assesses the ability to execute a controlled roll, testing both flexibility and coordination. It reflects the individual's capacity for smooth movement transitions.
2. Roll: Similar to the front roll, this test focuses on overall movement control and coordination. It provides insight into how well an individual can manage spatial awareness during dynamic movements.
3. Jumping Half-Turn: This test measures balance, coordination, and lower body strength by requiring the individual to perform a 180-degree jump. It is useful for assessing the agility and spatial awareness necessary for various sports.
4. Jumping Full-Turn: Expanding on the half-turn, the full-turn jump assesses the ability to perform a complete 360-degree rotation. This test is a strong indicator of overall motor skill proficiency and coordination.

The Johnsen–Methney Test is widely used in school physical education programs and sports training camps to help identify talent and areas of improvement in motor skills and overall athletic potential.

6. THE ROLE AND IMPORTANCE OF FITNESS TESTING

Fitness testing in sports and physical education serves several key purposes, making it a cornerstone of both athletic training and general health monitoring.

6.1 Key Benefits of Fitness Testing

1. Assessment of Physical Condition: Fitness tests provide objective data on various aspects of physical health, such as strength, endurance, flexibility, and cardiovascular performance. This information is essential for identifying an individual's baseline fitness level.
2. Tracking Progress Over Time: Regular testing allows athletes, students, and older adults to monitor their progress, adjust training regimens, and set realistic goals. It serves as motivation by highlighting improvements and areas where further effort is needed.
3. Injury Prevention: By identifying weaknesses or imbalances in the body, fitness testing helps prevent injuries. Early detection of potential issues allows for corrective exercises and adjustments in training to reduce the risk of strain or overuse injuries.
4. Customized Training Programs: Fitness tests enable coaches, trainers, and healthcare professionals to tailor training and nutrition programs to individual needs. Customized programs are more effective in enhancing performance and overall well-being.
5. Motivation and Accountability: The objective data derived from these tests provide tangible feedback. This can motivate individuals to adhere to their training programs and remain committed to their fitness goals.

6.2 Broad Applications Across Age Groups

1. For School Children: Early fitness assessments promote a lifelong commitment to health and well-being. They help in developing motor skills, balance, and coordination, laying the foundation for future sports participation.
2. For Athletes: Athletes benefit from detailed evaluations of their physical capacities. Tests like the Harvard Step Test and BMR calculations are crucial for optimizing performance, tailoring diets, and designing effective training regimens.

3. For Senior Citizens: Regular fitness assessments help older adults maintain independence, manage age-related decline, and monitor overall health. The Rikli & Jones Senior Citizen Fitness Test is particularly useful in this regard.

MULTIPLE CHOICE QUESTION

1. Body Mass Index is one of the common ways of assessing healthy body weight. Which of the following BMI range is considered for healthy weight?
- (a) 25.0 – 29.0
 - (b) 30.0 – 34.9
 - (c) 18.5 – 24.9
 - (d) 35.0 – 39.9

Ans : 2024

(c) 18.5 – 24.9

A BMI between 18.5 and 24.9 is considered a healthy weight. Below 18.5 is underweight, 25.0–29.9 is overweight, and above 30 is obese. Maintaining a BMI within this range helps reduce the risk of lifestyle diseases.

2. In partial curl up test the difference between two parallel lines is _____.
- (a) 8 inches
 - (b) 4 inches
 - (c) 6 inches
 - (d) 10 inches

Ans : 2024

(c) 6 inches

In the partial curl-up test, the distance between two parallel lines is 6 inches. This test measures abdominal strength and endurance by counting the number of curl-ups performed while keeping hands within the designated distance.

3. Match the following.

	List-I		List-II
I.	Plate Tapping Test	1.	Upper body strength endurance of boys
II.	Push-up	2.	Speed and coordination of limb movement
III.	Partial Curl up	3.	Upper body strength endurance of girls.

IV.	Modified push up	4.	Abdominal strength
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Choose the correct option from the following :

	I	II	III	IV
(a)	2	1	4	3
(b)	2	3	1	4
(c)	1	3	2	4
(d)	2	3	4	1

Ans : 2023

(a) I-2, II-1, III-4, IV-3

The Plate Tapping Test (I-2) assesses speed and coordination of limb movement. Push-ups (II-1) measure upper body strength endurance in boys, while Partial Curl-ups (III-4) evaluate abdominal strength. Modified Push-ups (IV-3) test upper body strength endurance in girls. Hence, the correct answer is (a).

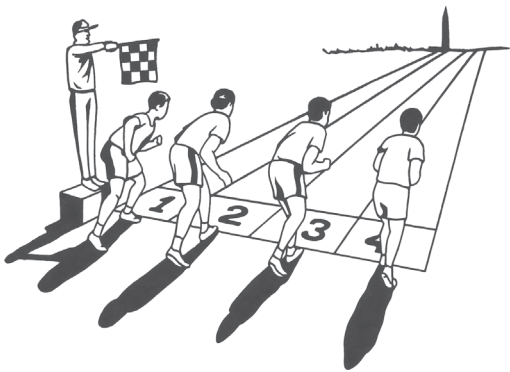
4. In 50 mt. standing start of Motor Fitness Test, time is taken nearest to
- (a) 10th of a second
 - (b) 9th of a second
 - (c) 5th of a second
 - (d) 20th of a second.

Ans : Term-I, 2021-22

(a) 10th of a second

The 50-meter sprint test records time up to the nearest tenth of a second for accuracy in measuring speed. It assesses explosive acceleration, essential in many sports.

5. Name the test shown in the picture.



- (a) 4 × 10 mt. relay
- (b) 50 mt. standing start
- (c) 600 mt. run/walk
- (d) Standing board jump

Ans : Term-I, 2021-22

(b) 50 mt. standing start

The image depicts athletes in a sprinting stance at the starting line, with an official signaling the start. This represents the 50-meter standing start, a test measuring speed and acceleration from a stationary position over a short distance.

6. The chief aim of physical activities during 5 to 17 years of age groups is to improve cardio-respiratory and muscular fitness, bone health, cardiovascular and to reduce symptoms of anxiety and depression.

Rate at which activity is performed is known as

- (a) Volume
- (b) Intensity
- (c) Type of activity
- (d) Frequency.

Ans :

Term-I, 2021-22

(b) Intensity

Intensity refers to the level of effort exerted during physical activity. It influences cardiovascular and muscular endurance, impacting fitness outcomes. Higher intensity exercises demand more energy and improve overall stamina and strength.

7. Sit and reach test is conducted for

- (a) Flexibility
- (b) Motor fitness
- (c) Endurance
- (d) Speed.

Ans :

SQP 2020

(a) Flexibility

This test evaluates lower back and hamstring flexibility. Participants reach forward while sitting, assessing their range of motion. It helps in detecting tightness, which can lead to injuries and reduced mobility.

8. Barrow Fitness Test does not include :

- (a) Medicine ball put
- (b) Zig-zag run
- (c) 600 metres run
- (d) Standing broad jump.

Ans :

COMP 2020

(c) 600 metres run

The Barrow Fitness Test assesses agility, strength, and power. It includes events like the zig-zag run, medicine ball put, and standing broad jump but does not include long-distance endurance running.

9. **Assertion (A) :** The Basal Metabolic Rate (BMR) is the number of calories needed to maintain body function at resting condition.

Reason (R) : A person who does not engage in any work, still requires energy for the functioning of their internal organs.

In the context of the above two statements, which of the following option is correct ?

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
- (c) Assertion (A) is true, but Reason (R) is false.
- (d) Assertion (A) is false. but Reason (R) is true.

Ans :

2024

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

BMR refers to the calories needed for bodily functions at rest. Even when inactive, energy is required, but this does not fully explain BMR's importance in metabolism regulation and weight maintenance.

10. Which of the following tests is conducted to measure cardiovascular fitness ?

- (a) Back scratch test
- (b) Rockport one mile test
- (c) Harvard step test
- (d) Both (b) and (c)

Ans :

Term-I, 2021-22

(d) Both (b) and (c)

Rockport One-Mile Walk Test and Harvard Step Test assess cardiovascular endurance by measuring heart rate recovery, a key indicator of aerobic fitness and efficiency in oxygen consumption.

11. Rockport test is used to measure

- (a) VO_3 Max.
- (b) VO_4 Max.
- (c) VO_5 Max.
- (d) VO_2 Max.

Ans :

Term-1, 2021-22

(d) VO_2 Max

The Rockport Test estimates VO_2 Max, measuring the body's oxygen consumption efficiency. Higher VO_2 Max indicates better cardiovascular endurance and stamina for aerobic exercises like running and cycling.

or endurance.

32. Which test can be applied to test Endurance?

- (a) Sit and Reach
- (b) Push Ups
- (c) 600 Mtr Run/Walk
- (d) Plate Tapping Test

Ans :

OD 2017

- (c) 600 Mtr Run/Walk

The 600-meter run/walk is used to assess cardiovascular endurance by measuring how well the body sustains prolonged activity. It challenges aerobic capacity, making it ideal for testing overall stamina rather than flexibility or muscular strength.

33. Partial curl up is to test .

- (a) agility and speed
- (b) leg strength and endurance
- (c) abdominal strength and endurance
- (d) upper body strength and endurance

Ans :

COMP 2009

- (c) Abdominal strength and endurance

The Partial Curl-Up Test evaluates the strength and endurance of the abdominal muscles. It requires repeated contraction of the core muscles, determining their ability to maintain performance without fatigue, which is critical for core stability and posture.

34. Sit and reach test measures

- (a) endurance
- (b) flexibility
- (c) strength
- (d) speed

Ans :

DELHI 2006

- (b) Flexibility

The Sit and Reach Test measures flexibility, especially in the lower back and hamstrings. It involves reaching forward from a seated position, indicating joint range of motion and muscle flexibility—key factors for preventing injuries and maintaining mobility.

35. The test duration for the Harvard fitness test is

- (a) 3 minutes
- (b) 4 minutes
- (c) 5 minutes
- (d) 6 minutes

Ans :

OD 2001

- (a) 3 minutes

The Harvard Step Test is conducted for 3 minutes. During this period, participants step on and off a bench at a constant pace. The test then uses recovery pulse counts to evaluate cardiovascular endurance and overall aerobic fitness.

36. The Harvard step test is developed by

- (a) Harvard
- (b) Brouha
- (c) Kansal
- (d) SAI

Ans :

FOREIGN 2004

- (b) Brouha

The Harvard Step Test was developed by Dr. Lucien Brouha in 1943. This test was designed to assess cardiovascular fitness by monitoring the heart rate recovery after a standardized stepping exercise, reflecting an individual's aerobic capacity.

37. What is BMI?

- (a) Bodily Mass Index
- (b) Body Mass Index
- (c) Boldy Mass Index
- (d) Bodley Mass Index

Ans :

SQP 2007

- (b) Body Mass Index

Body Mass Index (BMI) is defined as weight in kilograms divided by height in meters squared. It estimates body fat and is used to categorize individuals as underweight, normal, overweight, or obese, aiding in health risk assessment widely in practice.

38. Which parameter is not required to assess the BMR

- (a) Weight
- (b) Height
- (c) Age
- (d) Name

Ans :

SQP 2008

- (d) Name

Assessing BMR requires factors such as weight, height, age, and gender because they influence metabolic rate. A person's name, however, does not affect energy expenditure and is irrelevant to calculating the Basal Metabolic Rate.

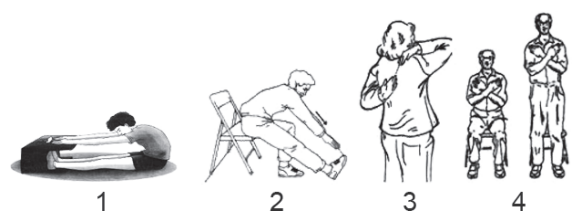
39. Which is not an item of Rikli and Jones Test?

- (a) 8 Foot Up and Go
- (b) Sit and Reach test
- (c) 6 Minute Walk Test
- (d) Arms Curl Test

Ans : Term-I, 2021-22

(a) 8 feet
In senior agility tests, an 8-foot distance is maintained between the chair and marker cone to evaluate movement coordination, reaction speed, and agility.

17. In a residential area, a camp was organised to check the functional fitness level of the senior citizens. During testing, it was found that there was a less range of motion in the joints of upper extremities in most of the elderly people. Which test is administrated to check this functional fitness component?



- (a) 1
- (b) 2
- (c) 3
- (d) 4

Ans : Term-I, 2021-22

(c) 3
The question describes a test used to assess the range of motion in the upper extremities of elderly individuals, which relates to flexibility. In the given image, option 3 depicts a flexibility test, making it the correct answer. Thus, the correct option is (c) 3.

18. Match the following.

1.		(A)	Lower body strength
2.		(B)	Lower body flexibility
3.		(C)	Upper body strength

4.		(D)	Abdominal strength
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Choose the correct option from the following :

	A	B	C	D
(a)	3	1	4	2
(b)	4	1	3	2
(c)	3	2	4	1
(d)	4	2	3	1

Ans : Term-I, 2021-22

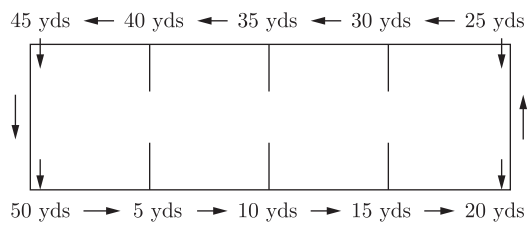
- (b) 4-A, 1-B, 3-C, 2-D

19. Which test is to be conducted to measure agility?
(a) Standing board jump
(b) 4 × 10 shuttle run
(c) Partial curl up
(d) Push-ups

Ans : Term-I, 2021-22

(b) 4 × 10 shuttle run
The Chair Sit-and-Reach Test measures lower body flexibility, particularly in older adults, helping assess leg and hip mobility, which is crucial for maintaining balance and preventing falls.

20. Identify the test for which this pattern is followed.



- (a) 600 mtr
- (b) 50 yard dash
- (c) 400 mtr
- (d) 6 min walk

Ans : Term-I, 2021-22

(d) 6 min walk
The given diagram represents a walking track with different yard measurements, indicating a structured walking test. This pattern is typically used for the 6-minute walk test, which measures cardiorespiratory endurance and functional fitness.

citizen can perform within a specified time. This test targets the biceps and overall upper limb strength, which are essential for daily activities and maintaining independence in older adults.

- 60.** Which test in the Rikli & Jones Senior Citizen Fitness Test assesses lower body flexibility?

- (a) Chair Sit & Reach Test
- (b) Back Scratch Test
- (c) Arm Curl Test
- (d) Eight Foot Up & Go Test

Ans :

DELHI 2012

- (a) Chair Sit & Reach Test

The Chair Sit & Reach Test assesses lower body flexibility by measuring how far a senior citizen can reach beyond their feet while seated. This test provides valuable insight into the flexibility of the hamstrings and lower back, contributing to overall mobility and reduced risk of injury.

- 61.** Which test in the Rikli & Jones battery is used to assess upper body flexibility?

- (a) Back Scratch Test
- (b) Arm Curl Test
- (c) Chair Stand Test
- (d) Six-Minute Walk Test

Ans :

OD 2005

- (a) Back Scratch Test

The Back Scratch Test is used to assess upper body flexibility by measuring how closely an individual can bring their hands together behind their back. This test evaluates shoulder and upper arm flexibility, which is important for daily tasks and maintaining overall upper body mobility.

- 62.** Which test in the Rikli & Jones Senior Citizen Fitness Test measures agility?

- (a) Six-Minute Walk Test
- (b) Eight Foot Up & Go Test
- (c) Chair Sit & Reach Test
- (d) Arm Curl Test

Ans :

FOREIGN 2011

- (b) Eight Foot Up & Go Test

The Eight Foot Up & Go Test measures agility by timing how quickly a senior citizen can rise from a seated position, walk eight feet, and return to the chair. This test is critical for assessing balance, coordination, and dynamic movement essential for safe mobility.

- 63.** Which test in the Rikli & Jones battery assesses aerobic endurance?

- (a) Six-Minute Walk Test
- (b) Eight Foot Up & Go Test
- (c) Chair Stand Test
- (d) Arm Curl Test

Ans :

SQP 2013

- (a) Six-Minute Walk Test

The Six-Minute Walk Test assesses aerobic endurance by measuring the distance a senior citizen can cover in six minutes. It evaluates cardiovascular and respiratory fitness, providing insight into overall endurance levels, which are essential for sustaining physical activity in older adults.

- 64.** What is the primary purpose of the Rikli & Jones Senior Citizen Fitness Test battery?

- (a) To assess academic performance
- (b) To measure athletic ability in youth
- (c) To evaluate overall fitness in senior citizens
- (d) To determine dietary habits

Ans :

COMP 2019

- (c) To evaluate overall fitness in senior citizens

The primary purpose of the Rikli & Jones Senior Citizen Fitness Test battery is to evaluate overall fitness in senior citizens. It assesses multiple components such as strength, flexibility, agility, and aerobic endurance, providing a comprehensive profile of functional fitness in older populations.

- 65.** Which test in the Johnsen – Methney Test of Motor Educability involves a forward rolling movement?

- (a) Front Roll
- (b) Jumping Half-Turn
- (c) Jumping Full-Turn
- (d) Back Scratch Test

Ans :

DELHI 2015

- (a) Front Roll

The Front Roll test in the Johnsen – Methney Test of Motor Educability involves a forward rolling movement. It assesses motor coordination and spatial awareness, contributing to an overall evaluation of a child's ability to execute complex motor tasks required in various athletic and everyday activities.

- 66.** Which component of the Johnsen – Methney Test involves a complete rolling movement?

- (a) Front Roll
- (b) Roll
- (c) Jumping Half-Turn
- (d) Jumping Full-Turn

risks for falls and functional limitations.

- 27.** Which test is used to test the functional ability amongst senior citizens?
 (a) Rockport one mile test
 (b) Harvard step test
 (c) Rikli and Jones test
 (d) Fitness Index score

Ans :

Term I, 2021-22

(c) Rikli and Jones test

This test measures functional independence, helping older adults assess their physical capacity for daily activities.

- 28.** What is the test duration for the Arm curl test?
 (a) 1 min
 (b) 2 min
 (c) 30 sec
 (d) Number of repetitions

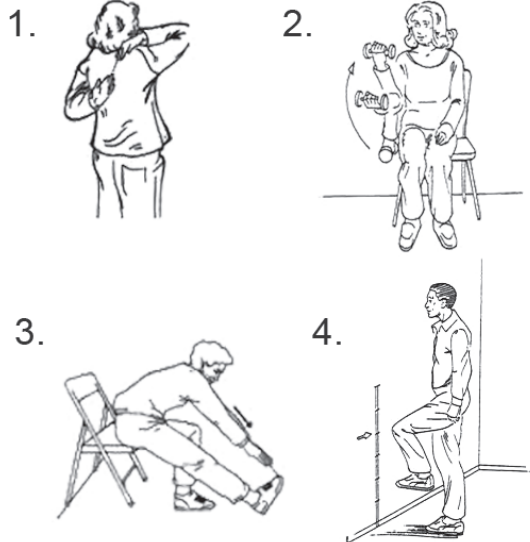
Ans :

Term I, 2021-22

(c) 30 sec

The Arm Curl Test measures upper body strength in seniors by counting bicep curls in 30 seconds, assessing muscle endurance.

- 29.** Identify the odd one.



- (a) 4
 (b) 3
 (c) 2
 (d) 1

Ans :

Term I, 2021-22

(a) 4

The images represent different fitness tests related to flexibility and strength. Images 1, 2,

and 3 focus on flexibility and mobility exercises. Image 4, however, depicts the Step Test, which measures cardiovascular endurance, making it the odd one out.

- 30.** Mr. Lakshman, aged 65 years worked as a civil engineer in a construction company. He had to walk and climb a lot as part of his job. After retirement, he settled with his son and spent time with his grandchildren. Nowadays, he is experiencing difficulty in doing certain chores which involve physical movement.



The test shown in the picture is performed to assess which component?

- (a) Agility
 (b) Endurance
 (c) Speed
 (d) Strength

Ans :

Term -1, 2021-22

(a) agility

The image shows an elderly person performing a walking agility test, often used to measure mobility and coordination in senior citizens. This test assesses how quickly and efficiently an individual can change directions while moving.

- 31.** Mtr Dash is conducted to test:

- (a) Strength
 (b) Acceleration
 (c) Flexibility
 (d) Endurance

Ans :

SQP 2013

(b) Acceleration

The 50-meter dash is designed to measure acceleration. It evaluates how quickly an athlete can increase speed from a standing start, emphasizing explosive power and short-distance sprinting ability rather than strength, flexibility,

12. What is the minimum number of steps to be done in one minute for 5 minutes, as shown in the figure?



- (a) 25
- (b) 30
- (c) 35
- (d) 40

Ans :

Term-I, 2021-22

- (b) 30

The image represents the Harvard Step Test, which measures cardiovascular endurance. In this test, a participant steps up and down on a platform for five minutes. The minimum number of steps required per minute for five minutes is 30.

13. Rockport test may be useful for those who are unable to run due to sedentary lifestyle or for older individual or for those of low fitness level or injury. In Rockport test, gender value for men is
- (a) 1
 - (b) - 1
 - (c) 0
 - (d) + 1

Ans :

Term-I, 2021-22

- (a) 1

In the Rockport formula, 1 is assigned to men and 0 to women to adjust for physiological differences in estimating VO₂ Max, ensuring accuracy in aerobic fitness calculations.

14. Rockport one mile test is conducted to measure
- (a) Cardio-vascular fitness
 - (b) Senior citizen's fitness
 - (c) Vital capacity
 - (d) Muscular strength.

Ans :

DELHI 2020

- (a) Cardio-vascular fitness

The Rockport One-Mile Walk Test assesses heart efficiency and oxygen intake capacity, making it useful for evaluating cardiovascular fitness in less active individuals, seniors, and those with low fitness levels.

15. Which functional fitness component of senior citizens is determined in the test shown below ?



- (a) Physical Mobility
- (b) Upper Body Flexibility
- (c) Lower Body Flexibility
- (d) Upper Body Strength

Ans :

2024

- (c) Lower Body Flexibility

The Chair Sit-and-Reach Test measures lower body flexibility, particularly in older adults, helping assess leg and hip mobility, which is crucial for maintaining balance and preventing falls.

16. What will be the distance between the chair and marker cone, to measure agility and co-ordination of senior citizens shown in the figure?



- (a) 8 feet
- (b) 12 feet
- (c) 16 feet
- (d) 18 feet

Ans :

COMP 2006

(b) Sit and Reach Test

The Rikli and Jones Test battery for seniors includes measures like the 8-Foot Up and Go, 6-Minute Walk, and Arm Curl Test. The Sit and Reach Test, which measures flexibility, is not part of this specific functional fitness assessment.

40. What is the weight of dumbbell for men in arm curl of Rikli and Jones Test?

- (a) 5 pounds
- (b) 6 pounds
- (c) 8 pounds
- (d) 10 pounds

Ans :

DELHI 2002

(c) 8 pounds

In the Rikli and Jones Senior Fitness Test, the Arm Curl Test uses an 8-pound dumbbell for men. This standard weight is chosen to assess upper-body strength and endurance effectively in older adults while ensuring safety.

41. Johnson-Metheny Test battery has _____ Items.

- (a) 6
- (b) 5
- (c) 4
- (d) 10

Ans :

OD 2010

(c) 4

The Johnson-Metheny Test Battery is composed of 4 items that evaluate core motor skills including balance, coordination, agility, and speed. This streamlined set of assessments provides a comprehensive overview of a child's motor proficiency, ensuring efficient and accurate performance measurement.

42. Johnson-Metheny Test battery does not consist of _____ motor stunts

- (a) Front Roll
- (b) Back Roll
- (c) Side Roll
- (d) Jumping FullTurns

Ans :

FOREIGN 2012

(c) Side Roll

The test battery includes stunts such as front roll, back roll, and jumping full-turns. However, it omits the side roll. This exclusion is intentional, as the battery focuses on forward and backward rotational movements rather than lateral rolling techniques.

43. Which test from the SAI Khelo India Fitness Test (for ages 5–8) is used to assess static balance?

- (a) BMI measurement
- (b) Plate Tapping Test
- (c) Flamingo Balance Test
- (d) Sit & Reach Test

Ans :

SQP 2005

(c) Flamingo Balance Test

The Flamingo Balance Test assesses static balance by measuring the ability to maintain equilibrium while standing on one leg. This test is especially useful for children aged five to eight years, facilitating early detection of balance impairments in early childhood.

44. Which test from the SAI Khelo India Fitness Test (for ages 5–8) measures hand-eye coordination and speed?

- (a) Plate Tapping Test
- (b) Flamingo Balance Test
- (c) BMI measurement
- (d) 50mt Speed Test

Ans :

COMP 2011

(a) Plate Tapping Test

The Plate Tapping Test measures hand-eye coordination and speed by timing how quickly a child can tap alternating plates. It is specifically designed for young children aged five to eight years, providing valuable insight into their neuromuscular coordination and motor skills.

45. What does BMI, measured in the SAI Khelo India Fitness Test, primarily indicate?

- (a) Muscle mass
- (b) Body fat estimation
- (c) Flexibility
- (d) Cardiorespiratory endurance

Ans :

DELHI 2003

(b) Body fat estimation

Body Mass Index (BMI) provides an estimate of body fat based on weight relative to height. It is a widely used screening tool in fitness tests, helping identify potential weight-related issues and overall nutritional status in children and adolescents across age groups.

46. Which test in the SAI Khelo India Fitness Test for ages 9–18 measures sprint speed?

- (a) 600 mt Run/Walk
- (b) 50 mt Speed Test
- (c) Sit & Reach Test
- (d) Strength Test

21. Harvard step is performed to check which kind of fitness?

(a) Cardiovascular
(b) Explosive strength
(c) Muscular strength
(d) Reaction ability

Ans :

Term-I, 2021-22

(a) Cardiovascular

The Harvard Step Test checks heart rate recovery post-exercise, assessing cardiovascular efficiency and aerobic endurance.

22. What will be the fitness index score of a girl if the test duration was 300 sec and the pulse count (1 min-1.5 min) was 80?

(a) 73.2
(b) 62.8
(c) 68.1
(d) 85.3

Ans :

Term-I, 2021-22

(c) 68.1

Fitness Index Score = $(300 \times 100) / (2 \times 80)$
= 68.1, indicating moderate cardiovascular endurance.

23. Harvard step test is also called the Aerobic Fitness Test. It was developed by Brouha and others in 1943. It is used to measure aerobic fitness by checking the recovery rate.

Few students were asked to conduct Harvard step test for their classmates and they were asked to note down the complete details of their aerobic capacity. For conducting tests they required a bench separate for boys 20 inches and girls 16 inches with one stop watch to note down the timing and their recovery rate.

How many times is the reading taken for calculating a long term fitness index ?

(a) 5
(b) 3
(c) 2
(d) 4

Ans :

Term-I, 2021-22

(b) 3

The test includes three pulse readings at different intervals post-exercise to assess recovery rate and aerobic fitness.

24. Senior Citizen Fitness Test the range of age group is _____.

(a) 60-94
(b) 55-79

(c) 65-95
(d) 50-90

Ans :

2023-24

(a) 60-94

The Senior Citizen Fitness Test assesses physical health in adults aged 60-94, ensuring age-specific fitness evaluation.

25. Match the following.

	List-I		List-II
I.	Plate Tapping Test	1.	Upper body strength endurance of boys
II.	Push-up	2.	Speed and coordination of limb movement
III.	Partial Curl up	3.	Upper body strength endurance of girls
IV.	Modified push up	4.	Abdominal strength

Choose the correct option from the following :

I II III IV

(a) 2 1 4 3
(b) 2 3 1 4
(c) 1 3 2 4
(d) 2 3 4 1

Ans :

2022-23

(a) I-2, II-1, III-4, IV-3

The correct matching of List-I with List-II is:

1. Plate Tapping Test (I → 2) → Measures speed and coordination of limb movement.
2. Push-up (II → 1) → Tests upper body strength endurance of boys.
3. Partial Curl-up (III → 4) → Assesses abdominal strength.
4. Modified Push-up (IV → 3) → Evaluates upper body strength endurance of girls.

26. Which test is developed to test fitness in senior citizens?

(a) Harvard step
(b) Rikli and Jones
(c) AAHPER
(d) Rockport

Ans :

Term I, 2021-22

(b) Rikli and Jones

The Rikli and Jones Test assesses senior citizens' mobility, flexibility, and endurance, identifying

- 53.** In the Harvard Step Test formula, what constant is used in the denominator?

(a) 4.5
(b) 5.5
(c) 6.5
(d) 7.5

Ans :

SQP 2020

(b) 5.5

The constant 5.5 is used in the Harvard Step Test formula. It acts as a calibration factor in the computation of the fitness index, ensuring that the duration of exercise and the post-exercise pulse count are appropriately balanced to yield a reliable measure of cardiovascular fitness.

- 54.** During the Harvard Step Test, when is the pulse count taken?

(a) Immediately after exercise
(b) 1–1.5 minutes after exercise
(c) 3 minutes after exercise
(d) During exercise

Ans :

COMP 2007

(b) 1–1.5 minutes after exercise

In the Harvard Step Test, the pulse count is taken between one to one and a half minutes after exercise completion. This timing ensures that the measurement reflects the body's recovery rate, providing an effective indicator of cardiorespiratory fitness and endurance capacity.

- 55.** What does the Harvard Step Test primarily assess?

(a) Muscular strength
(b) Flexibility
(c) Cardio-vascular fitness
(d) Agility

Ans :

DELHI 2003

(c) Cardio-vascular fitness

The Harvard Step Test primarily assesses cardio-vascular fitness by evaluating how quickly an individual's heart rate recovers after exercise. This recovery rate is a key indicator of cardiovascular endurance, reflecting the efficiency of the heart, lungs, and vascular system during physical stress.

- 56.** What is computed by the Basal Metabolic Rate (BMR)?

(a) Energy expenditure during exercise
(b) Energy required at rest
(c) Total calories burned in a day
(d) Muscle mass index

Ans :

OD 2008

(b) Energy required at rest

Basal Metabolic Rate (BMR) computes the energy required by the body at rest to maintain essential physiological functions. It represents the minimum caloric needs necessary for basic metabolic processes, such as breathing, circulation, and cellular repair, irrespective of physical activity levels.

- 57.** Which factor does NOT significantly influence the BMR?

(a) Age
(b) Weight
(c) Height
(d) Flexibility

Ans :

FOREIGN 2006

(d) Flexibility

Flexibility does not significantly influence Basal Metabolic Rate (BMR). Instead, BMR is primarily affected by factors such as age, weight, height, and gender. These parameters determine the overall energy requirements of the body for maintaining vital metabolic functions while at rest.

- 58.** Which test in the Rikli & Jones Senior Citizen Fitness Test measures lower body strength?

(a) Arm Curl Test
(b) Chair Stand Test
(c) Back Scratch Test
(d) Eight Foot Up & Go Test

Ans :

SQP 2002

(b) Chair Stand Test

The Chair Stand Test measures lower body strength by evaluating how many times a senior citizen can stand up from a seated position in a set time. This test effectively assesses leg muscle strength and endurance, which are critical for maintaining mobility and functional independence.

- 59.** Which test in the Rikli & Jones battery evaluates upper body strength?

(a) Chair Stand Test
(b) Arm Curl Test
(c) Sit & Reach Test
(d) Six-Minute Walk Test

Ans :

COMP 2010

(b) Arm Curl Test

The Arm Curl Test evaluates upper body strength by measuring the number of arm curls a senior

Ans :

OD 2011

(b) 50 mt Speed Test

The 50 mt Speed Test measures sprint speed over a short distance, evaluating an athlete's explosive power and acceleration. This test is essential for assessing quickness in children aged nine to eighteen years, contributing valuable data regarding performance capabilities.

47. Which test from the SAI Khelo India Fitness Test (ages 9–18) is used to assess aerobic capacity?

(a) Plate Tapping Test
(b) 600 mt Run/Walk
(c) Partial Abdominal Curl Up
(d) Modified Push-Up

Ans :

FOREIGN 2013

(b) 600 mt Run/Walk

The 600 mt Run/Walk evaluates aerobic capacity by measuring how efficiently an athlete covers the distance. It assesses endurance and cardiovascular fitness in children and adolescents aged nine to eighteen years, providing crucial insights into their overall aerobic performance level.

48. Which test in the SAI Khelo India Fitness Test (ages 9–18) is designed to assess flexibility?

(a) 50 mt Speed Test
(b) Sit & Reach Test
(c) BMI measurement
(d) Strength Test

Ans :

SQP 2015

(b) Sit & Reach Test

The Sit & Reach Test is designed to assess flexibility, particularly in the lower back and hamstring muscles. It measures the distance reached beyond the toes while seated, providing an important indicator of overall flexibility in children and adolescents during fitness assessments.

49. Which exercise is used as the strength test for assessing core strength in the SAI Khelo India Fitness Test for ages 9–18?

(a) Push-Ups
(b) Partial Abdominal Curl Up
(c) Modified Push-Up
(d) Plate Tapping

Ans :

COMP 2019

(b) Partial Abdominal Curl Up

The Partial Abdominal Curl Up is used to assess core strength by measuring abdominal muscle endurance. This exercise is incorporated into the SAI Khelo India Fitness Test for ages nine

to eighteen, providing insight into the functional strength and stability of the core muscles.

50. For boys aged 9–18 in the SAI Khelo India Fitness Test, which strength test is specifically prescribed?

(a) Modified Push-Ups
(b) Push-Ups
(c) Partial Abdominal Curl Up
(d) Sit & Reach Test

Ans :

DELHI 2014

(b) Push-Ups

In the SAI Khelo India Fitness Test for boys aged nine to eighteen, traditional Push-Ups are prescribed to assess upper body strength and endurance. This test measures the capacity of the chest, arms, and shoulder muscles, crucial for overall athletic performance and fitness evaluation.

51. For girls aged 9–18 in the SAI Khelo India Fitness Test, which strength test is adapted for their evaluation?

(a) Push-Ups
(b) Modified Push-Ups
(c) Partial Abdominal Curl Up
(d) 50mt Speed Test

Ans :

OD 2016

(b) Modified Push-Ups

The Modified Push-Up is adapted for girls aged nine to eighteen to assess upper body strength with adjustments suitable for their physiological differences. This variation provides a fair evaluation of muscular endurance and strength while accommodating differences in upper body development compared to traditional push-ups.

52. In the Harvard Step Test, what is the primary parameter recorded during exercise?

(a) Maximum heart rate
(b) Duration of exercise in seconds
(c) Total steps taken
(d) Distance covered

Ans :

FOREIGN 2018

(b) Duration of exercise in seconds

In the Harvard Step Test, the duration of exercise in seconds is a primary parameter recorded to assess cardiorespiratory fitness. This value, multiplied and adjusted in the test's formula, reflects an individual's endurance and overall cardiovascular performance during strenuous physical activity.

Ans :

OD 2014

(b) Roll

The Roll component in the Johnsen – Methney Test involves a complete rolling movement. It evaluates basic motor coordination, body control, and balance. This fundamental skill is crucial for motor educability, helping to identify areas needing improvement in a child's physical development.

67. Which component of the Johnsen – Methney Test involves a jump with a half-turn?

- (a) Front Roll
- (b) Roll
- (c) Jumping Half-Turn
- (d) Jumping Full-Turn

Ans :

FOREIGN 2016

(c) Jumping Half-Turn

The Jumping Half-Turn component in the Johnsen – Methney Test requires a jump followed by a 180-degree turn. This test evaluates advanced motor coordination, spatial orientation, and agility. It is used to gauge a child's ability to perform more complex, dynamic motor tasks efficiently.

68. Which component of the Johnsen – Methney Test involves a jump with a complete turn?

- (a) Front Roll
- (b) Roll
- (c) Jumping Half-Turn
- (d) Jumping Full-Turn

Ans :

SQP 2020

(d) Jumping Full-Turn

The Jumping Full-Turn component in the Johnsen – Methney Test involves a jump followed by a 360-degree rotation. This test assesses a child's advanced motor skills, balance, and spatial awareness. It is an indicator of high motor educability and overall athletic potential in dynamic activities.

69. What does the Johnsen – Methney Test of Motor Educability primarily assess?

- (a) Academic intelligence
- (b) Motor learning and coordination
- (c) Dietary habits
- (d) Cardio-vascular fitness

Ans :

COMP 2018

(b) Motor learning and coordination

The Johnsen – Methney Test of Motor Educability primarily assesses motor learning and

coordination by evaluating movements such as rolling and jumping turns. This test is essential for determining a child's ability to acquire and perform complex motor skills that are critical for overall physical development.

70. Which test is common to both age groups in the SAI Khelo India Fitness Test?

- (a) Flamingo Balance Test
- (b) BMI measurement
- (c) Plate Tapping Test
- (d) Sit & Reach Test

Ans :

DELHI 2017

(b) BMI measurement

BMI measurement is common to both age groups in the SAI Khelo India Fitness Test. It provides a basic estimate of body fat based on weight relative to height, making it a fundamental parameter for assessing overall health and fitness in children from early to later school years.

71. Which SAI Khelo India test specifically evaluates rapid upper-limb movement in younger children?

- (a) BMI measurement
- (b) Plate Tapping Test
- (c) Flamingo Balance Test
- (d) 50mt Speed Test

Ans :

OD 2009

(b) Plate Tapping Test

The Plate Tapping Test specifically evaluates rapid upper-limb movement and coordination in younger children. It measures the speed of hand movements, providing important data on neuromuscular control and motor function essential for assessing early physical development in primary school students.

72. Which test is used in the SAI Khelo India Fitness Test to assess flexibility in older children and adolescents?

- (a) Sit & Reach Test
- (b) Partial Abdominal Curl Up
- (c) 600mt Run/Walk
- (d) Plate Tapping Test

Ans :

FOREIGN 2006

(a) Sit & Reach Test

The Sit & Reach Test is used to assess flexibility in older children and adolescents by measuring the range of motion in the lower back and hamstrings. It is a key component in evaluating overall flexibility, which is important for injury prevention and athletic performance development.

The Chair Sit-and-Reach Test evaluates hamstring and lower-back flexibility, crucial for mobility and injury prevention. It is particularly useful for older adults, allowing them to perform the test safely while seated, thereby minimizing balance demands.

94. The Back Scratch Test primarily measures:



- (a) Upper-body strength
- (b) Upper-body flexibility
- (c) Cardiovascular endurance
- (d) Agility

Ans :

COMP 2015

- (b) Upper-body flexibility

The Back Scratch Test evaluates shoulder joint range of motion and overall upper-body flexibility. Participants reach one hand over the shoulder and the other up the back to see how closely they can bring their hands together.

TWO MARKS QUESTIONS

95. What is the formula for computation of the Fitness Index?

Ans :

Delhi 2019

- (I) Fitness Index score

$$= \frac{100 \times \text{Test duration in seconds}}{2 \times \text{sum of heart beats in the recovery periods}}$$

- (II) Fitness Index score

$$= \frac{100 \times \text{Test duration in seconds}}{5.5 \times \text{pulse count between 1 to 1.5 minutes after exercise}}$$

96. What test would you suggest for Senior Secondary student to measure Cardio Vascular fitness?

Ans :

Delhi 2016 C

For Senior Secondary students, I would recommend the Harvard Step Test. This test is widely used to measure cardiovascular fitness as it is simple to administer, cost-effective, and provides a clear indication of aerobic endurance by assessing the recovery heart rate after a standardized exercise period.

97. Explain in brief “The Harvard Step Test”.

Ans :

AI 2015

The Harvard Step Test is a simple, standardized test used to evaluate cardiovascular fitness and endurance. In this test, an individual steps up and down on a platform at a predetermined rate for a specific duration (until exhaustion or for a fixed period). After the exercise, the heart rate is measured during the recovery period (typically 1–1.5 minutes post-exercise). The recorded heart rate, along with the total duration of exercise, is used to calculate a fitness index—a higher index indicates better cardiovascular fitness.

98. Calculate the Physical Fitness Index using short formula for a 12 years old boy having completed Harvard Step Test for duration of 3 minutes and a pulse rate of 54 beats for 1 to 1.5 minute.

Ans :

Delhi 2015

Physical Fitness Index

$$= \frac{\text{Duration of exercise in seconds} \times 100}{5.5 \times \text{pulse count of 1 to 1.5 minute after exercise}}$$

$$= \frac{180 \times 100}{5.5 \times 54} = 60.60$$

The result falls in the ‘low average’ category.

99. Mr. X performs the Harvard step test for 275 seconds and his pulse in 1 – 1.5 min after exercise was 100. Write the formula of fitness index score for Harvard step test and calculate the fitness index score of Mr. X.

Ans :

2024

Formula of fitness index score for Harvard step test is :

Fitness index score = $(100 \times \text{test duration in seconds}) \div (2 \times \text{sum of heartbeat in recovery period})$

Fitness index score of X is

$$= (275 \times 100) \div (2 \times 100)$$

$$= 137.5$$

Computation of fitness index = $(\text{Duration of exercise in seconds} \times 100) \div (5.5 \times \text{pulse rate of$

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movement evaluates balance, body awareness, and coordination, which are critical for overall motor educability and physical skill development in children.

- 80.** Which test is used to measure motor educability in the Johnsen – Methney Test through a full rotational jump?
 (a) Front Roll
 (b) Roll
 (c) Jumping Half-Turn
 (d) Jumping Full-Turn

Ans :

DELHI 2015

(d) Jumping Full-Turn
 The Jumping Full-Turn in the Johnsen – Methney Test requires a jump followed by a complete 360-degree rotation. This test evaluates advanced motor coordination, balance, and spatial awareness, providing important insights into a child's overall motor educability and athletic potential.

- 81.** Which fitness test parameter is common between the SAI Khelo India Fitness Test and Rikli & Jones Senior Citizen Test?
 (a) Plate Tapping Test
 (b) BMI measurement
 (c) Chair Stand Test
 (d) Eight Foot Up & Go Test

Ans :

OD 2019

(b) BMI measurement
 BMI measurement is common between the SAI Khelo India Fitness Test and many fitness assessments. It provides a quick estimation of body composition by relating weight to height. This parameter is useful across various age groups for monitoring nutritional and fitness status consistently.

- 82.** What is the significance of measuring Basal Metabolic Rate (BMR) in sports nutrition and training?
 (a) To assess flexibility
 (b) To determine resting energy expenditure
 (c) To evaluate cardiovascular endurance
 (d) To measure muscular strength

Ans :

FOREIGN 2014

(b) To determine resting energy expenditure
 Measuring Basal Metabolic Rate (BMR) is significant because it determines the resting energy expenditure required for maintaining basic physiological functions. This information

is crucial for planning nutritional strategies, optimizing training regimens, and managing body composition for enhanced sports performance.

- 83. Assertion (A) :** The SAI Khelo India Fitness Test for children aged 5–8 (classes 1–3) includes assessments like BMI, Flamingo Balance Test, and Plate Tapping Test.

Reason (R) : These tests are chosen because they evaluate basic body composition, balance, and coordination, which are key fitness parameters in young children.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

SQP 2016

(a) Both A and R are true, and R is the correct explanation for A

The assertion correctly lists the components of the fitness test for ages 5–8. The reason is accurate because BMI assesses body composition, while the Flamingo and Plate Tapping tests evaluate balance and coordination—essential components in early fitness assessment.

- 84. Assertion (A) :** For children aged 9–18 (classes 4–12), the SAI Khelo India Fitness Test comprises BMI, a 50 m Speed Test, a 600 m Run/Walk, a Sit & Reach flexibility test, and strength assessments.

Reason (R) : Including both endurance and strength tests ensures a comprehensive evaluation of cardiovascular fitness, flexibility, and muscular strength in school-aged children.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

COMP 2017

(a) Both A and R are true, and R is the correct explanation for A

The assertion accurately outlines the test components for the 9–18 age group. The reason is correct because these varied tests collectively assess multiple fitness dimensions—cardiovascular endurance, flexibility, and strength—which are critical for evaluating overall fitness in school-aged children.

Ans :

SQP 2015

1. Comparison:
 - i. Jumping Half-Turn: Involves a jump followed by a 180° turn before landing, testing balance and basic rotational coordination.
 - ii. Jumping Full-Turn: Requires a complete 360° rotation, demanding higher balance, timing, and spatial awareness.
2. Skill Requirement : The full-turn is generally more challenging and provides insight into the child's advanced motor control and agility.

- 122.** How can integrating tests such as the SAI Khelo India Fitness Test, Harvard Step Test, and the Rikli & Jones Senior Citizen Fitness Test provide a comprehensive view of an individual's fitness across age groups?

Ans :

COMP 2011

Integration Benefits:

1. Using age-appropriate tests allows for the assessment of key fitness components—strength, flexibility, endurance, and motor coordination—across different life stages.
 2. This comprehensive approach facilitates targeted training interventions and personalized fitness plans that address the unique needs and capabilities of each age group, ensuring lifelong fitness and health.
- 123.** In your opinion, why is it important to use standardized tests in sports and physical education, and how do these tests contribute to developing effective training programs?

Ans :

DELHI 2013

1. Importance of Standardization:
 - i. Standardized tests provide reliable, objective measures of performance and fitness.
 - ii. They allow educators, coaches, and trainers to track progress over time, identify strengths and weaknesses, and compare results against normative data.
2. Contribution to Training Programs:
 - i. These assessments guide the development of individualized training plans, ensuring that programs are tailored to improve specific areas such as cardiovascular endurance, muscular strength, or motor skills.
 - ii. Ultimately, they contribute to more effective, safe, and efficient athletic

development and overall physical well-being.

THREE MARKS QUESTIONS

- 124.** List down the test items of Rikli and Jones fitness test and explain the procedure of any one.

or

What are the components of Rikli and Jones Test? Explain the purpose and procedure of any one test.

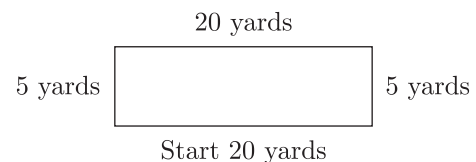
Ans :

Delhi 2019

Rikli and Jones Test for Senior Citizens : The Rikli and Jones Test is designed to assess the physical fitness of senior citizens. It includes the following test items:

1. Chair Stand Test
2. Arm Curl Test
3. Chair Sit and Reach Test
4. Back Scratch Test
5. Eight-Foot Up and Go Test
6. Six-Minute Walk Test
7. Six-Minute Walk Test

Purpose : This test helps in the early identification of individuals at risk by assessing their aerobic endurance and overall fitness level. It provides valuable insight into a person's cardiovascular and respiratory health.



Procedure:

1. Equipment Required: Stopwatch and measuring tape.
2. Setup: A walking course in a rectangular area measuring 50 yards (45.72 meters).
3. Test Execution: The participant walks as far as possible within six minutes at their own pace. They can stop at any time if needed.
4. Scoring: The total distance covered in six minutes is recorded to the nearest yard or meter.

- 125.** Write down the objective and administration of the flamingo balance test.

Ans :

2022-23

(c) A is true but R is false

The assertion is correct; the Johnsen–Methney Test is designed to assess physical motor skills through tasks like rolls and jumps. The reason is false because these tests primarily evaluate motor abilities, not cognitive functions, making the statement inaccurate.

- 90. Assertion (A) :** Incorporating diverse tests—from school fitness assessments to senior citizen evaluations—ensures a comprehensive evaluation of physical fitness across different age groups.

Reason (R) : Standardized fitness assessments, while useful, fail to accommodate individual variability in physical development and aging.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

DELHI 2003

(c) A is true but R is false

The assertion is true since tailored fitness tests address different developmental and aging needs. However, the reason is false because standardized tests are designed with normative data that account for variability, even though individual differences exist; thus, they remain valuable for broad assessments.

- 91. The Plate Tapping Test primarily measures:**



- (a) Lower-body power
 (b) Abdominal strength
 (c) Speed and coordination of upper-limb movement
 (d) Cardiorespiratory endurance

Ans :

OD 2008

(c) Speed and coordination of upper-limb movement

The Plate Tapping Test evaluates how quickly and accurately a person can move one hand

between two designated spots. It reflects upper-limb speed and hand-eye coordination, making it a valuable assessment in sports requiring rapid arm movements.

- 92. The Arm Curl Test primarily assesses:**



- (a) Lower-body strength
 (b) Upper-body strength and endurance
 (c) Cardiovascular endurance
 (d) Agility

Ans :

FOREIGN 2006

(b) Upper-body strength and endurance

The Arm Curl Test evaluates muscular strength and endurance in the upper body, focusing on the biceps. It is commonly performed by older adults, using a standard dumbbell weight (often 8 lbs for men, 5 lbs for women) within 30 seconds.

- 93. The Chair Sit-and-Reach Test primarily measures:**



- (a) Upper-body flexibility
 (b) Lower-body flexibility
 (c) Cardiovascular endurance
 (d) Abdominal strength

Ans :

SQP 2002

(b) Lower-body flexibility

2. Importance : This test evaluates flexibility of the lower back and hamstrings, which is crucial for injury prevention and overall mobility, especially during rapid growth phases in children.

107. How do strength tests differ for boys and girls in the SAI Khelo India Fitness Test for ages 9–18, and why are these modifications important?

Ans : COMP 2018

1. Differences : Boys typically perform standard push-ups, while girls perform modified push-ups to accommodate differences in upper body strength and developmental stages.
2. Importance : These modifications ensure that the test is age and gender-appropriate, allowing fair assessment and helping to encourage participation by providing achievable goals that match typical physical development.

108. What role does the BMI test play in the overall fitness assessment in school settings, and what are its limitations?

Ans : DELHI 2020

1. Role : BMI is used as a quick screening tool to assess body composition, helping identify potential underweight, overweight, or obesity issues among students.
2. Limitations : BMI does not differentiate between muscle and fat mass, and thus may not accurately reflect the fitness level of highly active children or athletes. It is best used in combination with other fitness tests to provide a comprehensive picture of health.

109. Explain the Harvard Step Test, including its procedure and how cardiovascular fitness is computed from it.

Ans : OD 2017

1. Procedure : The subject steps up and down on a standardized bench at a set pace for a fixed duration.
2. Computation : Cardiovascular fitness is calculated using the formula:

$$(\text{Duration of Exercise in Seconds} \times 100) / (5.5 \times \text{Pulse count during 1–1.5 minutes post-exercise}).$$
 This score provides an index of the subject's aerobic capacity and overall cardiovascular endurance.

110. What are the benefits of using the Harvard Step Test in sports and fitness assessments?

Ans : FOREIGN 2009

1. It is simple, cost-effective, and requires minimal equipment.
2. It provides a standardized measure of cardiovascular endurance and recovery rate, which can be used to track improvements over time and assess the effectiveness of training programs.

111. Describe the concept of Basal Metabolic Rate (BMR) and its relevance to sports nutrition and training.

Ans : SQP 2006

1. Concept : BMR is the amount of energy expended by the body at rest to maintain essential physiological functions like breathing, circulation, and cell production.
2. Relevance : Knowing an athlete's BMR helps in designing individualized nutrition plans, ensuring they consume enough calories to fuel training, support recovery, and maintain overall health while avoiding excess weight gain.

112. How can BMR be computed, and what factors might influence its accuracy?

Ans : COMP 2001

1. Computation : BMR can be estimated using formulas such as the Harris-Benedict Equation, which takes into account age, gender, weight, and height.
2. Influencing Factors : Factors include muscle mass, hormonal balance, and overall activity level. Variations in these parameters can affect the precision of BMR estimates, so adjustments may be needed for athletes with higher muscle mass or unique metabolic conditions.

113. Discuss how regular monitoring of cardiovascular fitness through tests like the Harvard Step Test can influence an athlete's training program.

Ans : DELHI 2004

Influence on Training:

1. Regular monitoring allows coaches to adjust training intensity based on improvements or declines in cardiovascular endurance.
2. It can help identify early signs of overtraining or potential health issues, enabling timely

1-1.5 min. after exercise)

$$= (275 \times 100) \div (5.5 \times 100) \\ = 50$$

- 100.** Explain the procedure of Harvard step test in detail.

Ans :

DELHI 2020

The Harvard Step Test assesses cardiovascular fitness. Participants step on a 45 cm platform at a fixed pace (e.g., 30 steps per minute) until exhaustion or for a set time. After the exercise, they immediately sit, and the recovery pulse is recorded for one minute, starting 1–1.5 minutes post-exercise. The exercise duration and recovery pulse are used to calculate the Fitness Index, indicating cardiovascular endurance. This standardized method ensures safety.

- 101.** What motor quality does a senior citizen lack, who finds difficulty in tying the shoe laces while sitting on a chair?

Ans :

Delhi 2017

The motor quality likely lacking is fine motor control, often referred to as manual dexterity. This skill involves the precise coordination of small muscles in the hands and fingers, which is essential for tasks like tying shoelaces. In seniors, a decline in fine motor skills is common due to age-related changes in the neuromuscular system, leading to difficulties in performing delicate and coordinated movements.

- 102.** Enlist four test items of Johnson-Metheny Test of Motor Educability.

Ans :

2024

Four test items of the Johnson-Metheny Test of Motor Educability are:

1. Front Roll
2. Roll
3. Jumping Half-Turn
4. Jumping Full-Turn

- 103.** Explain the procedure and scoring of 600 meter run/walk.

Ans :

2023-24

1. Procedure : Participants are instructed to cover a distance of 600 meters as quickly as possible, beginning at the signal “ready, start.” They may run or walk, but the aim is to complete the distance in the shortest time. Upon finishing, the elapsed time is

immediately announced to each participant.

2. Scoring : The score is determined by the total time taken to complete the 600 meters, recorded in minutes and seconds.

- 104.** Explain the components of the SAI Khelo India Fitness Test for children aged 5–8 years (classes 1–3) and the significance of each test.

Ans :

OD 2019

1. Components:
 - i. BMI: Assesses body mass relative to height, providing an indicator of healthy growth.
 - ii. Flamingo Balance Test: Measures static balance by counting the number of attempts needed to maintain a one-legged stance.
 - iii. Plate Tapping Test: Evaluates hand-eye coordination and reaction time through rapid tapping between two plates.
2. Significance: These tests collectively gauge fundamental physical fitness, motor skills, and balance in young children, forming a baseline for early physical development.

- 105.** For the age group 9–18 years (classes 4–12), list the tests included in the SAI Khelo India Fitness Test and describe the purpose of the 600m Run/Walk test.

Ans :

FOREIGN 2014

1. Tests Included : BMI, 50m Speed Test, 600 m Run/Walk, Sit & Reach Flexibility Test, and Strength Tests (Partial Abdominal Curl Up, Push-Ups for boys, Modified Push-Ups for girls).
2. Purpose of 600 m Run/Walk Test : It measures aerobic endurance and cardiovascular fitness. The performance on this test indicates the efficiency of the heart and lungs, as well as overall stamina during sustained physical activity.

- 106.** Describe the procedure for conducting the Sit & Reach flexibility test and its importance for school-aged children.

Ans :

SQP 2016

1. Procedure : The participant sits on the floor with legs extended and feet placed against a measuring box or sit-and-reach apparatus. They then reach forward as far as possible, keeping the knees straight.

- 85. Assertion (A) :** The Harvard Step Test computes cardiovascular fitness using the formula: $(\text{Duration in seconds} \times 100) / (5.5 \times \text{Pulse count measured 1–1.5 minutes after exercise})$.

Reason (R) : A lower computed value on the Harvard Step Test indicates superior cardiovascular fitness.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2009

- (c) A is true but R is false

The assertion correctly states the formula used in the Harvard Step Test. However, the reason is false because a higher fitness index (resulting from a lower pulse count or longer duration) indicates better cardiovascular fitness—not a lower value.

- 86. Assertion (A) :** Basal Metabolic Rate (BMR) is computed to estimate the energy expenditure of an individual at complete rest.

Reason (R) : BMR calculations depend primarily on an individual's current physical activity levels rather than on intrinsic factors like age, weight, and height.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2006

- (c) A is true but R is false

The assertion is correct because BMR estimates resting energy expenditure. The reason is false, as BMR is influenced by intrinsic factors such as age, weight, height, and gender—not by physical activity levels, which affect total daily energy expenditure separately.

- 87. Assertion (A) :** The Rikli & Jones Senior Citizen Fitness Test includes the Chair Stand Test, Arm Curl Test, and Six-Minute Walk Test to assess strength, flexibility, and aerobic endurance in older adults.

Reason (R) : These tests are specifically designed to evaluate functional fitness components that are critical for maintaining independence among seniors.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2001

- (a) Both A and R are true, and R is the correct explanation for A

The assertion correctly identifies key tests in the Rikli & Jones protocol, and the reason is accurate. Each test measures a distinct functional component (strength, flexibility, endurance) essential for daily activities and independence in older adults.

- 88. Assertion (A) :** In the Rikli & Jones test, the Back Scratch Test is used to assess upper body flexibility in senior citizens.

Reason (R) : Upper body flexibility is not an important predictor of overall functional ability in older adults.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2004

- (c) A is true but R is false

The assertion is correct; the Back Scratch Test evaluates upper body flexibility. However, the reason is false because upper body flexibility contributes to tasks like dressing and reaching, making it a meaningful component of overall functional ability in seniors.

- 89. Assertion (A) :** The Johnsen–Methney Test of Motor Educability uses tasks such as the Front Roll and Jumping Full-Turn to assess motor skills in children.

Reason (R) : Such motor educability tests primarily evaluate cognitive function rather than physical motor skills.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2007

interventions to prevent injury and optimize performance.

3. Additionally, tracking changes in fitness over time motivates athletes and provides measurable benchmarks for progress.

- 114.** Describe the Chair Stand Test and its role in evaluating lower body strength in senior citizens.

Ans : OD 2007

1. Procedure : The participant sits on a chair and stands up fully without using their arms, then sits down repeatedly for a set time or number of repetitions.
2. Role : This test measures lower body strength, which is essential for maintaining mobility, independence, and reducing the risk of falls in older adults.

- 115.** Explain the Arm Curl Test and its significance in assessing upper body strength in senior citizens.

Ans : FOREIGN 2003

1. Procedure : Using a light hand weight, the participant performs as many bicep curls as possible within a specified time frame (usually 30 seconds).
2. Significance : The test provides an objective measure of upper body strength, important for daily activities such as lifting objects and overall functional fitness in older adults.

- 116.** What does the Chair Sit & Reach Test measure, and why is lower body flexibility important for seniors?

Ans : SQP 2008

1. Measurement : This test assesses the flexibility of the lower back and hamstrings by measuring how far the participant can reach beyond their toes while seated.
2. Importance : Lower body flexibility is crucial for maintaining proper posture, reducing the risk of injury, and facilitating daily movements like bending and reaching, thereby enhancing overall quality of life.

- 117.** Describe the Eight Foot Up & Go Test and its importance in evaluating agility in senior citizens.

Ans : COMP 2006

1. Procedure : The participant starts seated, stands up, walks eight feet, turns around, returns, and sits back down as quickly as possible.

2. Importance : This test measures agility, balance, and dynamic coordination. Good performance in this test correlates with a lower risk of falls and improved functional mobility in daily activities.

- 118.** How does the Six-Minute Walk Test assess aerobic endurance in senior citizens, and what does it indicate about overall fitness?

Ans : DELHI 2002

1. Procedure : Participants are instructed to walk as far as possible in six minutes on a flat, measured course.
2. Indication : The distance covered reflects aerobic endurance and cardiovascular fitness. A longer distance suggests better endurance and overall fitness, which is vital for maintaining independence and quality of life in older adults.

- 119.** What is the purpose of the Johnsen – Metheny Test of Motor Educability, and what basic motor skills does it assess?

Ans : OD 2010

1. Purpose : The test is designed to evaluate motor learning and coordination abilities in children, identifying their potential for acquiring complex motor skills.
2. Assessed Skills : It includes tasks such as the Front Roll, Roll, Jumping Half-Turn, and Jumping Full-Turn, each assessing aspects like balance, spatial awareness, coordination, and agility.

- 120.** Explain the procedure for the Front Roll component of the Johnsen – Metheny Test and its significance.

Ans : FOREIGN 2012

1. Procedure : The child performs a forward roll on a soft surface, ensuring smooth movement and correct body positioning throughout the roll.
2. Significance : This component assesses the child's ability to coordinate movements, manage spatial orientation, and safely execute a controlled roll, which are fundamental skills in overall motor development.

- 121.** Compare the Jumping Half-Turn and Jumping Full-Turn components of the Metheny Test in terms of complexity and skill requirement.

73. Which test from the Harvard Step Test formula is multiplied by 100?

- (a) Pulse count
- (b) Exercise duration in seconds
- (c) Height in centimeters
- (d) Age in years

Ans :

SQP 2001

- (b) Exercise duration in seconds

In the Harvard Step Test formula, the exercise duration in seconds is multiplied by 100. This product, divided by the constant and pulse count, produces a fitness index that reflects the individual's cardiorespiratory efficiency and overall cardiovascular endurance after exercise.

74. Which of the following is NOT a component measured in the Rikli & Jones Senior Citizen Fitness Test?

- (a) Lower body strength
- (b) Agility
- (c) Upper body flexibility
- (d) Reaction time

Ans :

COMP 2004

- (d) Reaction time

Reaction time is not measured in the Rikli & Jones Senior Citizen Fitness Test. Instead, the test focuses on lower and upper body strength, flexibility, agility, and aerobic endurance, providing a comprehensive assessment of functional fitness in senior citizens for overall health evaluation.

75. Which parameter is essential in computing the Harvard Step Test index?

- (a) Weight of the athlete
- (b) Pulse count after exercise
- (c) Height of the athlete
- (d) Number of steps taken

Ans :

DELHI 2010

- (b) Pulse count after exercise

The pulse count recorded 1–1.5 minutes after exercise is essential in computing the Harvard Step Test index. It reflects the heart rate recovery, an important indicator of cardiorespiratory fitness, and is combined with exercise duration to determine overall cardiovascular performance.

76. What is the main purpose of computing Basal Metabolic Rate (BMR) in sports science?

- (a) To determine maximal strength
- (b) To estimate energy requirements at rest
- (c) To assess flexibility
- (d) To measure aerobic endurance

Ans :

OD 2012

(b) To estimate energy requirements at rest
Computing Basal Metabolic Rate (BMR) estimates the energy requirements of the body at rest, determining the calories needed for essential metabolic functions. This information is crucial in sports science for planning diets, managing weight, and optimizing overall performance and recovery.

77. Which test is used to measure upper body strength in senior citizens according to Rikli & Jones?

- (a) Chair Stand Test
- (b) Arm Curl Test
- (c) Back Scratch Test
- (d) Six-Minute Walk Test

Ans :

FOREIGN 2005

- (b) Arm Curl Test

The Arm Curl Test is used in the Rikli & Jones Senior Citizen Fitness Test to measure upper body strength. It evaluates the endurance and strength of the arm muscles by counting the number of curls performed within a set time, contributing to a comprehensive fitness assessment in older adults.

78. Which test in the Rikli & Jones battery measures agility in senior citizens?

- (a) Chair Sit & Reach Test
- (b) Back Scratch Test
- (c) Eight Foot Up & Go Test
- (d) Arm Curl Test

Ans :

SQP 2011

- (c) Eight Foot Up & Go Test

The Eight Foot Up & Go Test measures agility in senior citizens by timing the rapid transition from a seated to a standing position, followed by a short walk. It assesses dynamic balance, coordination, and mobility, providing essential data on functional agility in older populations.

79. Which component of the Johnsen – Methney Test assesses basic motor coordination through rolling?

- (a) Front Roll
- (b) Jumping Half-Turn
- (c) Jumping Full-Turn
- (d) Sit & Reach Test

Ans :

COMP 2013

- (a) Front Roll

The Front Roll component of the Johnsen – Methney Test assesses basic motor coordination through a forward rolling movement. This

Flamingo Balance Test : The Flamingo Balance Test evaluates an individual's ability to maintain balance on one leg while assessing the strength of the leg, pelvic, and trunk muscles. It specifically measures static balance and lower body stability.

Test administration :

1. The participant stands on a beam, initially maintaining balance with the instructor's support if needed.
2. Once stable, the participant balances on the preferred leg while bending the free leg at the knee and holding the foot close to the buttocks.
3. The stopwatch starts as soon as the instructor releases support.



4. Each time the participant loses balance—either by stepping off the beam or releasing the held foot—the stopwatch is paused.
5. The process continues, with time resuming after each restart, while counting the number of balance losses within 60 seconds.
6. If the participant loses balance more than 15 times within the first 30 seconds, the test is terminated.

- 126.** Explain the components of the SAI Khelo India Fitness Test for schools. How do the tests differ between the 5–8 years age group (classes 1–3) and the 9–18 years age group (classes 4–12)?

Ans :

OD 2017

The SAI Khelo India Fitness Test is designed to assess physical fitness across age groups with age-appropriate tests:

1. Age Group 5–8 years (Classes 1–3):
 - i. BMI: Measures body mass relative to height.
 - ii. Flamingo Balance Test: Evaluates balance by counting the number of trials needed to maintain stability.
 - iii. Plate Tapping Test: Assesses hand–eye coordination and speed.
2. Age Group 9–18 years (Classes 4–12):

- i. BMI: Continues to monitor growth and weight status.
- ii. 50m Speed Test: Evaluates sprinting ability and speed.
- iii. 600m Run/Walk: Tests endurance by measuring how quickly a student covers this distance.
- iv. Sit & Reach Flexibility Test: Assesses flexibility, particularly of the lower back and hamstrings.
- v. Strength Test: Uses partial abdominal curl-ups and push-ups (standard for boys, modified for girls) to gauge muscular endurance and strength.

- 127.** Describe the Harvard Step Test and explain how it is used to measure cardiovascular fitness. Include the formula for computing the fitness index.

Ans :

FOREIGN 2007

The Harvard Step Test is a submaximal cardiovascular fitness assessment. The test procedure involves:

1. Step Exercise: The participant steps up and down a platform at a fixed pace for a specific duration until exhaustion or for a set time.
2. Pulse Recovery: After completing the exercise, the participant's pulse is measured for 1–1.5 minutes during recovery.
3. Fitness Index Calculation: The formula used is: $\text{Fitness Index} = (\text{Duration of Exercise in Seconds} \times 100) / (5.5 \times \text{Pulse Count during Recovery})$.
4. This index reflects cardiovascular endurance, where a higher score indicates better cardiovascular fitness. The test is popular for its simplicity and ability to standardize evaluation across different individuals.

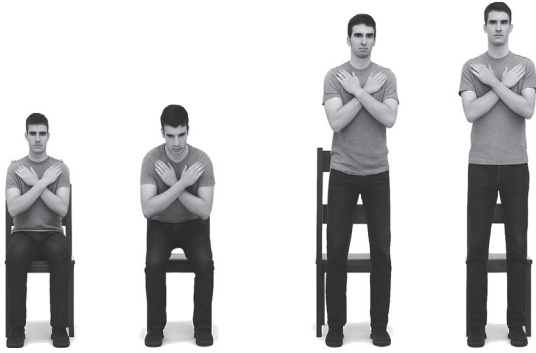
- 128.** Explain the concept of Basal Metabolic Rate (BMR) and outline a common method used to compute it.

Ans :

SQP 2010

Basal Metabolic Rate (BMR) represents the number of calories required by the body to maintain basic physiological functions at rest, such as breathing, circulation, and cell production.

1. Importance: It provides an estimate of daily energy expenditure, which is crucial for designing dietary plans and understanding energy balance in athletes and non-athletes alike.
2. Common Method for Computation:



3. Procedure:
 - i. Place the chair against a wall for stability.
 - ii. Sit in the middle of the chair with feet flat on the floor, shoulder-width apart, and back straight.
 - iii. Cross your arms at the wrist and place them against your chest.
 - iv. At the signal, rise to a full standing position and sit back down as many times as possible within 30 seconds.
4. Test Guidelines:
 - i. Each stand must be fully upright before sitting down.
 - ii. The participant must sit completely before standing again—no partial sitting.
 - iii. Do not use hands for support unless absolutely necessary.
 - iv. Arms should remain crossed against the chest and not swing for momentum.
 - v. If the subject is in the middle of standing when time is up, it counts as a completed stand.
5. Scoring : The score is the total number of correctly completed chair stands within 30 seconds.
6. Risk Zone: Fewer than 8 unassisted stands for men and women indicate a risk of mobility decline.

Arm Curl Test for Upper Body Strength :

1. Purpose and Daily Benefits : This test assesses upper body strength, which is essential for performing everyday tasks such as:
 - i. Lifting and carrying groceries or suitcases.
 - ii. Holding and playing with grandchildren.
 - iii. Performing household activities that require arm strength.
2. Equipment Required:
 - i. 5-pound (2.27 kg) weight for women.
 - ii. 8-pound (3.63 kg) weight for men.
 - iii. A chair without armrests.
 - iv. A stopwatch.

3. Procedure:
 - i. Sit on a chair with feet flat on the floor.
 - ii. Hold the weight in the dominant hand (or strongest side) using a suitcase grip (palm facing inward).
 - iii. Keep the upper arm close to the body, allowing only the lower arm to move.
 - iv. Curl the weight upwards, gradually turning the palm upward (flexion with supination).
 - v. Fully bend the elbow, then fully extend it back to the starting position.
 - vi. Repeat the action continuously for 30 seconds.
4. Scoring : The score is the total number of correctly completed arm curls within 30 seconds.
5. Risk Zone: Fewer than 11 curls for men and women suggests reduced upper body strength.

- 162.** Your grandmother feels that she has reduced her upper body flexibility and therefore she wants to test herself. Which test would you suggest to her?

Ans :

AI 2017, Delhi 2015

Back Scratch Test for Upper Body Flexibility

1. Purpose : The Back Scratch Test evaluates upper body flexibility, which is essential for daily activities such as:
 - i. Reaching for objects on high shelves.
 - ii. Changing a light bulb.
 - iii. Combing hair.
 - iv. Wearing overhead garments.
2. Equipment : Ruler for measurement.
3. Procedure:
 - i. The participant stands in an upright position.
 - ii. Raise the left arm straight up over the left shoulder.
 - iii. Bend the left elbow, reaching behind the back with fingers extended. The elbow should point toward the ceiling.
 - iv. Simultaneously, place the right arm behind the back, with the palm facing outward and fingers extended upward.
 - v. Attempt to bring both hands as close together as possible, either touching or overlapping.
 - vi. Perform two practice attempts with each arm, and record the measurement on the more flexible side.
 - vii. The test partner adjusts finger positioning to align the fingertips in a straight direction before measuring the distance.

Basal Metabolic Rate (BMR) is the measure of energy expenditure at rest, representing the calories needed for essential bodily functions.

1. Computation:

Harris-Benedict Equation: For example, for men:

$$\text{BMR} = 66.5 + (13.75 \times \text{weight in kg}) + (5.003 \times \text{height in cm}) - (6.775 \times \text{age in years})$$

A similar formula is applied for women with different coefficients.

2. Relevance : BMR helps determine the daily caloric requirements of an athlete, ensuring that nutritional plans provide sufficient energy for both basic bodily functions and additional demands from training. This information is crucial in designing diets that support performance, recovery, and overall health.

134. (a) Explain the significance of the Chair Stand and Arm Curl tests in the Rikli & Jones Senior Citizen Fitness Test.

- (b) How do these tests reflect the functional fitness of older adults?

Ans :

COMP 2019

(a) Significance:

- i. Chair Stand Test : Measures lower body strength by assessing how many times an individual can rise from a seated position in a given period.
- ii. Arm Curl Test : Evaluates upper body strength by counting the number of arm curls performed with a set weight in a fixed time.

(b) Reflection of Functional Fitness:

- i. Chair Stand Test: Indicates the strength necessary for everyday activities like standing up and climbing stairs, which is vital for maintaining independence.
- ii. Arm Curl Test: Reflects the ability to carry objects, perform household tasks, and maintain upper body strength.

Together, these tests provide insight into the muscular strength and endurance required for daily living, helping to identify areas that may need improvement to prevent falls and injuries.

135. Discuss the components of the Johnsen – Methney Test of Motor Educability and explain how they contribute to evaluating motor skills in children.

Ans :

DELHI 2006

The Johnsen – Methney Test of Motor Educability evaluates fundamental motor skills through a series of activities:

1. Front Roll: Assesses coordination and the ability to control body movement during a forward roll.
2. Roll: Tests the capability to perform a complete roll, reflecting overall balance and spatial awareness.
3. Jumping Half-Turn: Evaluates the skill to execute a jump combined with a 180-degree rotation, indicating agility and coordination.
4. Jumping Full-Turn: Involves a complete 360-degree rotation during a jump, requiring advanced balance, timing and motor planning.

These components help educators identify strengths and developmental needs in motor control, facilitating targeted interventions to enhance overall motor performance in children.

136. (a) Compare the Harvard Step Test and the Six-Minute Walk Test in terms of what aspect of cardiovascular fitness they measure.

- (b) Explain why different tests might be used for different populations (e.g., athletes vs. senior citizens).

Ans :

OD 2008

(a) Comparison:

- i. Harvard Step Test : Primarily measures cardiovascular endurance and recovery by using a standardized stepping exercise followed by a pulse count, providing a fitness index.
- ii. Six-Minute Walk Test : Evaluates aerobic endurance by measuring the distance an individual can cover in six minutes, reflecting submaximal exercise capacity.

(b) Different Populations:

- i. Athletes : May require more intensive tests like the Harvard Step Test that challenge their cardiovascular system at higher intensities, reflecting their training levels.
- ii. Senior Citizens : Benefit from the Six-Minute Walk Test as it is less strenuous and more reflective of everyday activities, focusing on maintaining functional capacity and endurance.

Different tests ensure that assessments are tailored to the physical abilities and safety considerations of each population.

Ans :

OD 2006

- (a) The purpose of the Arm Curl Test is to determine the upper body strength of senior citizens. This is important for daily tasks that require lifting and carrying objects, such as groceries, suitcases, or grandchildren.

- (b) The equipment required is a straight-back chair without arms, a stopwatch, and dumbbells (5 pounds for women, 8 pounds for men).

Procedure: The participant sits on the chair with their back straight and feet on the floor, holding the dumbbell in their dominant hand with a “handshake grip”. On the “Go” command, they perform as many arm curls as possible in 30 seconds, moving through a full range of motion from a fully extended to a fully flexed position. The maximum number of correct curls is counted as the score.

157. (a) What components of strength does the SAI Khelo India Fitness Test assess for the 9-18 years age group?
- (b) Explain the procedure for conducting the Modified Push-Ups test for girls.

Ans :

FOREIGN 2002

- (a) For the 9-18 years age group, the SAI Khelo India Fitness Test assesses two key components of strength:

1. Abdominal Strength: This is measured using the Partial Curl-up test.
2. Muscular Endurance (Upper Body Strength): This is measured using Push-Ups for boys and Modified Push-Ups for girls.

- (b) The Modified Push-Up test for girls assesses upper body strength endurance.

Procedure: The starting position is with hands and knees touching the floor. The body and legs should be in a straight line from the head to the knees. Keeping the back straight, the participant lowers her body until there is a 90-degree angle at the elbows. She then returns to the starting position with arms fully extended. This action is repeated until exhaustion or until she can no longer maintain the correct form. The score is the total number of correctly completed push-ups.

158. (a) What is the purpose of the Sit and Reach Test?
- (b) Briefly describe the equipment and procedure for this test.

Ans :

SQP 2017

- (a) The purpose of the Sit and Reach test is to measure the flexibility of the lower back and the hamstring muscles. This is an important measure because tightness in this area is often linked to issues like lumbar lordosis and lower back pain.

- (b) The primary equipment is a Sit and Reach box, which is a specially designed box with a measuring scale on top.

Procedure: The participant sits on the floor with their legs stretched out straight and feet flat against the box. With palms down and hands on top of each other, the participant reaches forward along the measuring line as far as possible, ensuring their knees remain locked and pressed to the floor. The position must be held for one to two seconds for the distance to be recorded. The score is the distance reached by the hands, measured in centimeters.

FIVE MARKS QUESTIONS

159. Explain the Rockport Test.

Ans :

AI 2017

Rockport Walking Test : The Rockport Walking Test is a sub-maximal field test designed to estimate VO_2 max in males and females aged 20 to 69 years. The participant must walk one mile (1.6 km) as quickly as possible without speed walking. This test is easy to administer and is particularly suitable for sedentary or older individuals.

1. Required Equipment:
 - i. A one-mile (1.6 km) track (not a treadmill).
 - ii. A stopwatch for timing the test.
2. Procedure:
 - i. A flat, uninterrupted one-mile (1.6 km) course is necessary, with a 400 m track's inside lane being the preferred location.
 - ii. Participants should wear appropriate clothing and footwear and perform 5–10

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- (a) **Integration Benefits:** Combining tests like the SAI Khelo India Fitness Test, which measures basic physical attributes and motor skills in children, with the Harvard Step Test, which assesses cardiovascular endurance, offers a multi-dimensional view of physical fitness. This comprehensive approach ensures that both skill development and aerobic capacity are evaluated, providing a more complete profile of an individual's fitness.
- (b) **Importance of Appropriateness :** Age and ability-appropriate tests ensure that the assessments are valid and reliable, reflecting the true capabilities of the participant without undue strain or risk. They allow for more accurate benchmarking and tailored training programs that match the developmental stage and physical condition of the individuals, ultimately enhancing performance and safety.

143. Outline the key components of school-based fitness testing under the SAI Khelo India initiative. How do these tests promote early identification of fitness strengths and weaknesses in students?

Ans :

SQP 2018

The key components include:

- For younger children (5–8 years) : BMI, Flamingo Balance Test, and Plate Tapping Test—focusing on basic coordination, balance, and body composition.
- For older children (9–18 years) : BMI, 50m Speed Test, 600 m Run/Walk, Sit & Reach Test, and strength assessments (Partial Abdominal Curl Up, Push-Ups for boys, Modified Push-Ups for girls)—addressing speed, endurance, flexibility, and muscular strength.

These tests allow educators to identify early signs of fitness deficits or exceptional abilities, enabling the design of targeted physical education programs that foster overall development and encourage lifelong fitness habits.

144. Explain the procedure and purpose of the Harvard Step Test. What does the recovery pulse measurement indicate about an individual's cardiovascular health?

Ans :

COMP 2010

The procedure involves a standardized stepping exercise followed by recording the participant's pulse during a defined recovery period.

- Purpose:** To assess cardiovascular endurance by evaluating how quickly the heart recovers after strenuous activity.
- Recovery Pulse Measurement:** A lower recovery pulse count indicates a more efficient cardiovascular system with better aerobic conditioning, while a higher count may signal lower cardiovascular fitness or the need for improved training.

145. What factors contribute to an individual's Basal Metabolic Rate (BMR), and why is BMR a critical parameter in developing sports nutrition plans?

Ans :

DELHI 2012

BMR is influenced by age, sex, body composition (muscle vs. fat), height, and weight. It is critical in sports nutrition because it estimates the baseline energy needs of an athlete at rest, forming the foundation for calculating total daily energy expenditure. This helps in designing diets that provide adequate calories for training, recovery, and overall performance, preventing both energy deficits and unnecessary weight gain.

- 146.** (a) Describe the importance of the Sit & Reach and Back Scratch tests in evaluating flexibility in different age groups.
- (b) How can flexibility assessments inform training programs for both young athletes and senior citizens?

Ans :

OD 2005

- (a) **Importance of Flexibility Tests:**
- Sit & Reach Test:** Primarily measures lower back and hamstring flexibility, crucial for preventing lower body injuries.
 - Back Scratch Test:** Assesses upper body flexibility, particularly in the shoulders, important for tasks requiring reaching and overhead movements.
- (b) **Informing Training Programs:**
- For young athletes, these assessments help identify early imbalances or limitations in flexibility, allowing for the integration of stretching routines that promote proper growth and injury prevention.
 - For senior citizens, flexibility assessments guide the development of gentle stretching and mobility exercises that maintain functional range of motion, reduce stiffness, and enhance overall quality of life.

- 137.** Outline the tests included in the SAI Khelo India Fitness Test for both younger (5–8 years) and older (9–18 years) students. Why is it important to adjust fitness tests based on age?

Ans :

FOREIGN 2005

For younger students (5–8 years), the test includes BMI, Flamingo Balance Test, and Plate Tapping Test to assess basic balance and coordination. For older students (9–18 years), the test expands to include BMI, a 50 m Speed Test, 600 m Run/Walk for endurance, Sit & Reach for flexibility, and strength tests (Partial Abdominal Curl-Up, Push-Ups for boys, Modified Push-Ups for girls).

Adjusting tests based on age is important because physical development, motor skills, and endurance vary with age. Age-specific tests ensure that assessments are appropriate, reliable, and helpful in guiding age-appropriate training and interventions.

- 138.** Explain how the Harvard Step Test is conducted and interpret what a high versus a low fitness index signifies about an individual's cardiovascular fitness.

Ans :

SQP 2014

The Harvard Step Test is conducted by having the participant step up and down on a platform at a set pace until exhaustion or for a fixed duration, followed by measuring the pulse during a 1–1.5-minute recovery period. The fitness index is calculated using the formula:

Fitness Index

$$= \frac{\text{Duration (in seconds)} \times 100}{5.5 \times \text{Pulse Count during recovery}}$$

A high fitness index indicates strong cardiovascular endurance and efficient recovery, while a low index suggests poorer cardiovascular fitness and potentially a slower recovery rate.

- 139.** What factors influence the Basal Metabolic Rate (BMR), and how can knowledge of BMR be applied to optimize an athlete's training and nutrition plan?

Ans :

COMP 2001

BMR is influenced by factors such as age, sex, body weight, height, and body composition. A higher muscle mass typically results in a higher BMR. Knowledge of BMR allows coaches and nutritionists to tailor an athlete's calorie intake, ensuring that the athlete consumes enough energy to support both basic bodily functions and the

additional demands of training, while also aiding in weight management and recovery strategies.

- 140.** (a) Describe two tests from the Rikli & Jones Senior Citizen Fitness Test and explain their significance in evaluating older adults' physical capabilities.
(b) How can the results of these tests be used to improve senior fitness programs?

Ans :

DELHI 2006

- (a) Tests Descriptions:
i. Chair Stand Test: Measures lower body strength by counting how many times an individual can stand from a seated position within a set time.
ii. Eight Foot Up & Go Test: Assesses agility and dynamic balance by timing how quickly a participant can stand, walk around a marker, and sit down again.
(b) Utilizing Test Results: The results help identify areas where seniors may be at risk for falls or have diminished strength. These insights can be used to tailor fitness programs that focus on strength training, balance improvement, and flexibility, thereby enhancing overall mobility and quality of life for older adults.

- 141.** Discuss the importance of the Johnsen – Methney Test of Motor Educability in assessing children's motor skills. How can the outcomes of this test inform physical education programs?

Ans :

OD 2013

The Johnsen – Methney Test of Motor Educability is crucial for assessing basic motor skills such as rolling and jumping with turns. These movements are foundational for more complex athletic skills.

Outcomes of this test help educators and coaches identify specific motor deficits, enabling them to develop targeted interventions and adaptive physical education programs that enhance coordination, balance, and overall motor development in children.

- 142.** (a) How does the integration of various fitness tests (like the SAI Khelo India and Harvard Step Test) provide a comprehensive picture of an individual's fitness level?
(b) Explain the importance of using age and ability-appropriate tests in sports measurement.

Ans :

FOREIGN 2016

a rate of 30 steps per minute for a total of 5 minutes. The pace is set by a metronome, with a four-count rhythm (up-up-down-down). If the participant cannot maintain the pace, the test is stopped, and the duration is noted. After the test, the participant sits down, and their heartbeats are counted for a 30-second period, specifically between 1 and 1.5 minutes after finishing the exercise.

2. Scoring : The Fitness Index score is calculated using the formula:

Fitness Index = (Duration of the Exercise in Seconds x 100) / (5.5 x Pulse count of 1-1.5 min after Exercise).

- 152.** What is Basal Metabolic Rate (BMR)? Provide the Mifflin-St Jeor equation used to calculate BMR for both males and females.

Ans :

FOREIGN 2016

Basal Metabolic Rate (BMR) is the number of calories your body needs to perform basic, life-sustaining functions while at rest. This is the energy required for the functioning of internal organs even when a person is not engaged in any physical work. BMR is influenced by factors such as muscle mass, age, gender, and genetics and is calculated in Kcal.

Mifflin-St Jeor equation for calculating BMR:

Male Calculation: $BMR = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age}) + 5$

Female Calculation: $BMR = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age}) - 161$

- 153.** Describe the purpose and procedure of the Back Scratch Test from the Rikli & Jones Senior Citizen Fitness Test battery.

Ans :

SQP 2007

The purpose of the Back Scratch Test is to assess the upper body flexibility of senior citizens, which is important for daily activities like reaching for items, combing hair, and getting dressed.

Procedure : The test is performed in a standing position. The participant places one hand over their shoulder and reaches as far down the middle of their back as possible. The other hand is placed behind their back, reaching up towards the top hand. The goal is to touch or overlap the middle fingers of both hands. The distance between the fingertips is then measured. If the fingers overlap, it's a positive score; if they don't touch, it's a negative score; and if they just touch, the score is zero.

- 154.** Explain the purpose and procedure of the Eight Foot Up & Go Test for assessing agility in senior citizens.

Ans :

COMP 2003

The purpose of the Eight Foot Up & Go Test is to assess the physical mobility of senior citizens, which includes components like power, speed, agility, and balance. This is a key indicator of their ability to move around quickly and safely in daily life.

Procedure : A chair is placed against a wall, and a cone is set 8 feet away. The participant starts seated on the chair with their feet flat on the floor. On the command "Go," they stand up, walk as quickly as possible (without running) to and around the cone, and return to sit back down in the chair. The score is the time taken from the "Go" command until the participant is seated again. Two attempts are given, and the best score is recorded.

- 155.** Describe the procedure for any two stunts from the Johnson-Metheny Test of Motor Educability.

Ans :

DELHI 2008

The Johnson-Metheny Test assesses neuromuscular skill capacity, or motor educability, using four stunts. Here are two of them:

1. Front Roll: The participant performs two front rolls on a mat that is 15 feet long and marked into sections. The first roll must be completed within the first 7.5 feet, and the second roll in the latter half. The participant must perform true front rolls without touching the side limits of the 2-foot wide lane. Each correct roll earns 5 points, with deductions for over-reaching lines or failing to perform a true roll.
2. Jumping Half-Turns: The participant starts on the first 3-inch wide line of the mat and jumps with both feet to the second 3-inch line while making a half-turn (left or right). They then jump to the third line, making a half-turn in the opposite direction, and continue this alternating pattern for four jumps. A perfect execution is worth 10 points, with 2 points deducted for each wrong jump (e.g., turning the wrong way or not landing on the line).

- 156.** (a) What is the purpose of the Arm Curl Test in the Rikli & Jones test battery?
(b) Describe the equipment required and the procedure for conducting this test.

- 147.** Discuss how the integration of the Rikli & Jones Senior Citizen Fitness Test components can help monitor the functional fitness of older adults. What practical applications does this have in community fitness programs?

Ans :

FOREIGN 2011

The Rikli & Jones Senior Citizen Fitness Test includes measures of strength, flexibility, agility, and aerobic endurance through tests like the Chair Stand, Arm Curl, Sit & Reach, Back Scratch, Eight Foot Up & Go, and Six-Minute Walk.

1. Monitoring Functional Fitness: Regular assessments can track changes in strength, balance, and endurance over time, helping to identify declines or improvements in physical function.
2. Practical Applications:
 - i. Informing personalized exercise prescriptions that address specific deficits.
 - ii. Enhancing community fitness programs by designing group exercises that improve overall mobility and reduce fall risk among seniors.

These applications support a proactive approach to aging, promoting independence and improved quality of life.

- 148.** (a) How do the tests for motor educability, such as those in the Johnsen – Methney Test, contribute to assessing fundamental movement skills in children?
- (b) Why is it important to identify and enhance these motor skills at an early age?

Ans :

SQP 2013

- (a) Contribution to Assessing Movement Skills: Tests like the Front Roll, Roll, Jumping Half-Turn, and Jumping Full-Turn are designed to evaluate a child's coordination, balance, agility, and spatial awareness. They provide a structured way to measure how well a child can learn and execute basic motor tasks.
- (b) Importance of Early Identification: Early detection of motor skill deficiencies allows educators and coaches to implement targeted interventions, ensuring that children develop the necessary coordination and balance for future athletic performance. This early enhancement not only improves physical competence but also builds confidence and supports overall cognitive and social development.

- 149.** Explain the procedure and scoring for the Plate Tapping Test as part of the SAI Khelo India Fitness Test for children aged 5-8 years.

Ans :

COMP 2015

The Plate Tapping Test is designed to measure the speed and coordination of an individual's limb movement.

1. Procedure : The test requires a table, two yellow discs (20 cm diameter), and a central rectangle (30 × 20 cm). The discs are placed 60 cm apart, with the rectangle in the middle. The participant places their non-preferred hand on the rectangle. On command, they must move their preferred hand back and forth between the two discs as quickly as possible, passing over the stationary hand each time. The test continues for 25 full cycles, which amounts to 50 taps.
2. Scoring : The score is the total time recorded in seconds that the participant takes to successfully complete the 25 cycles.

- 150.** Describe the procedure for conducting the 600-meter Run/Walk test for students in the 9-18 years age group. What component of fitness does this test measure?

Ans :

DELHI 2019

The 600-meter Run/Walk test is designed to measure Cardiovascular Endurance.

Procedure : The test should be conducted on a 200 m or 400 m track, preferably flat and even, with clear start and finish lines. Participants are instructed to cover the 600-meter distance at the fastest pace they can sustain. The test begins with the command "ready, start". While the objective is to cover the distance in the shortest time possible, walking is permitted if necessary. As each participant crosses the finish line, their elapsed time is announced and recorded. The final score is the total time taken to complete the distance, recorded in minutes and seconds.

- 151.** Explain the Harvard Step Test for measuring aerobic fitness, including its procedure and scoring formula.

Ans :

OD 2014

The Harvard Step Test, developed by Brouha in 1943, is a test of aerobic fitness that measures the body's ability to recover from work.

1. Procedure : Using a bench or block 20 inches high, the participant steps up and down at

minutes of light stretching before starting.
The test should be conducted on a day without strong wind.

- iii. The participant walks one mile as quickly as possible while maintaining a natural walking pace (no speed walking).
- iv. Immediately after completing the test, record the participant's heart rate (HR). A heart rate monitor is preferred, but HR can also be measured using 15-second pulse palpation at the carotid or radial artery.
- v. VO_2 max is estimated using a formula that considers body weight (lbs), age (years), gender (male = 1, female = 0), time to complete one mile (minutes), and post-exercise heart rate (bpm).

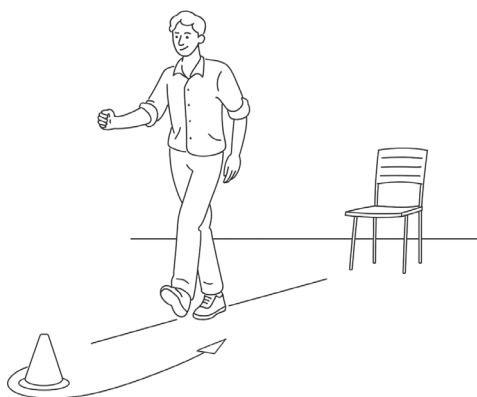
Estimated VO_2 max $\text{ml.kg}^{-1} \text{ min}^{-1} = 132.853 - 0.0769 (\text{Weight}) - 0.3877 (\text{Age}) + 6.315 (\text{Gender}) - 3.2649 (\text{Time}) - 0.1565 (\text{HR})$ It is important to note that completion time must be converted to minutes.

160. Explain the “Eight Foot Up and Go” Test for measuring agility and dynamic balance.

Ans :

COMP 2018

1. Purpose : The Eight-Foot Up and Go Test assesses coordination, agility, and balance in elderly individuals. It measures dynamic balance and speed, which are crucial for performing daily activities such as getting off a bus, moving quickly in the kitchen, reaching the bathroom, or answering the phone.
2. Equipment Required:
 - i. Stopwatch
 - ii. Straight-back or folding chair (approximately 17 inches/44 cm high)
 - iii. One marker/cone
 - iv. Measuring tape
 - v. Obstacle-free testing area



3. Procedure:

- i. Setup: Place the chair next to a wall for safety and position the marker 8 feet (2.44 m) away from the chair. Ensure the path between them is clear.
- ii. Starting Position: The participant sits fully seated in the chair with hands resting on knees and feet flat on the ground.
- iii. Test Execution: On the command “Go,” the participant stands up and walks (not runs) as quickly and safely as possible to the marker, circles around it, and returns to sit in the chair.
- iv. Timing: The stopwatch starts when the participant begins to move and stops once they return to a seated position.
- v. Scoring : The total time (in seconds) taken to complete the task is recorded. A higher time indicates lower agility and balance.
- vi. Risk Zone: Individuals taking more than 9 seconds may have a higher risk of mobility issues.

161. What is the purpose of Rikli and Jones fitness test? Explain the procedure of its any two test items in detail.

Ans :

2023

Improving functional mobility and preventing physical weakness and frailty are key objectives for fitness advisors working with older adults. Maintaining mobility enables senior citizens to perform daily activities without pain or difficulty, enhancing their overall quality of life.

To design effective exercise programs for seniors, two important prerequisites must be met:

1. Understanding the physical attributes required for mobility in later years.
2. Assessing physical capabilities to identify weak areas and target them for improvement.

Chair Stand Test for Lower Body Strength :

1. Purpose and Daily Benefits : This test measures lower body strength in adults over 60 years of age. Strong lower body muscles are essential for performing daily tasks such as:
 - i. Getting up from a chair, bus seat, or car.
 - ii. Rising from a kneeling position.
 - iii. Preventing falls by maintaining stability.
2. Equipment:
 - i. A sturdy chair without armrests.
 - ii. A stopwatch for timing the test.

Harris-Benedict Equation: One widely used formula. For example, for men:

$$\text{BMR} = 66.5 + (13.75 \times \text{weight in kg}) + (5.003 \times \text{height in cm}) - (6.775 \times \text{age in years})$$

- 129.** List and briefly describe the six components of the Rikli & Jones Senior Citizen Fitness Test. What does each test measure?

Ans :

COMP 2015

The Rikli & Jones Senior Citizen Fitness Test comprises six assessments designed to evaluate various aspects of physical fitness in older adults:

1. Chair Stand Test: Measures lower body strength by counting the number of times a person can stand from a seated position within a set time.
2. Arm Curl Test: Assesses upper body strength through the number of arm curls completed in a fixed period.
3. Chair Sit & Reach Test: Evaluates lower body flexibility by measuring the distance reached while seated.
4. Back Scratch Test: Assesses upper body flexibility by measuring the distance between the hands when reaching behind the back.
5. Eight Foot Up & Go Test: Measures agility and dynamic balance by timing how quickly a participant can rise, walk around a marker, and return to a seated position.
6. Six-Minute Walk Test: Evaluates aerobic endurance by recording the distance covered in six minutes of continuous walking.

- 130.** Discuss the purpose of the Johnsen – Methney Test of Motor Educability. What motor skills are evaluated in this test?

Ans :

DELHI 2018

The Johnsen – Methney Test of Motor Educability is designed to assess a child's or novice athlete's ability to learn and perform fundamental motor skills. The test evaluates:

1. Front Roll: Assesses coordination and body control during a forward roll.
2. Roll: Evaluates the ability to execute a complete roll, indicating balance and spatial awareness.
3. Jumping Half-Turn: Tests the skill of jumping followed by a 180-degree rotation, emphasizing coordination and agility.
4. Jumping Full-Turn: Involves jumping and completing a 360-degree turn, requiring

advanced balance, timing and spatial orientation.

- 131.** Describe the components of the SAI Khelo India Fitness Test for the 9–18 years age group. What physical attributes are being assessed, and why are these tests important for adolescent athletes?

Ans :

OD 2009

For the 9–18 years age group, the SAI Khelo India Fitness Test includes:

1. BMI: Monitors body composition and growth.
2. 50 m Speed Test: Evaluates sprinting ability and acceleration, critical for sports that require quick bursts of speed.
3. 600 m Run/Walk: Assesses cardiovascular endurance and stamina.
4. Sit & Reach Test: Measures flexibility, particularly of the lower back and hamstrings, important for injury prevention.
5. Strength Tests:
6. Partial Abdominal Curl Up: Tests core strength.
7. Push-Ups (Boys)/Modified Push-Ups (Girls): Evaluate upper body muscular endurance.

- 132.** Outline the procedure for the Harvard Step Test and explain how its results are used to evaluate cardiovascular fitness.

Ans :

FOREIGN 2003

The Harvard Step Test procedure involves:

1. Exercise Phase: The participant steps up and down a standard bench at a set pace until exhaustion or for a predetermined duration.
2. Recovery Phase: After the exercise, the participant's pulse is recorded for 1–1.5 minutes.
3. Calculation: The fitness index is calculated using the formula:

$$\text{Fitness Index} = (\text{Duration of Exercise in Seconds} \times 100) / (5.5 \times \text{Pulse Count during Recovery}).$$

A higher fitness index indicates better cardiovascular efficiency and endurance. This test is valued for its simplicity and effectiveness in comparing the cardiovascular fitness of individuals in a standardized way.

- 133.** What is Basal Metabolic Rate (BMR), and how is it typically computed? Discuss its relevance in sports nutrition.

Ans :

SQP 2012

4. Scoring:
 - i. Positive Score: If the fingers overlap, the overlap distance is recorded.
 - ii. Zero Score: If the fingertips just touch, the score is 0.
 - iii. Negative Score: If the fingertips do not touch, the gap between them is measured in half-inch or centimeters, resulting in a negative score.

This test helps assess shoulder and upper body flexibility, which is crucial for maintaining mobility and preventing stiffness.
5. Risk zone : Men : Minus (-) 4 inches or more
Women: Minus (-) 2 inches or more

163. What test would you suggest to measure upper body strength for aged population?

Ans :

Delhi 2016

Arm Curl Test for Upper Body Strength

1. Purpose : The Arm Curl Test evaluates upper body strength, which is essential for everyday tasks such as:
 - i. Lifting and carrying groceries, suitcases, or other objects.
 - ii. Holding and playing with grandchildren.
 - iii. Performing household chores that require arm strength.
2. Equipment Required:
 - i. 5-pound (2.27 kg) weight for women.
 - ii. 8-pound (3.63 kg) weight for men.
 - iii. A chair without armrests.
 - iv. A stopwatch.
3. Procedure:
 - i. The participant sits on a chair with their feet flat on the floor.
 - ii. Holding the weight in the dominant hand, the arm is positioned vertically downward beside the chair in a suitcase grip (palm facing inward).
 - iii. The upper arm remains braced against the body while only the lower arm moves (a tester may assist in keeping the upper arm steady).
 - iv. The participant curls the arm upward through a full range of motion, gradually turning the palm upward (supination).
 - v. The elbow must be fully bent and then fully straightened before the next curl.
 - vi. The participant repeats the motion as many times as possible within 30 seconds.
4. Scoring : The total number of correctly performed arm curls within 30 seconds is recorded.

5. Risk Zone : Completing less than 11 curls indicates reduced upper body strength.
This test helps assess an individual's ability to perform daily activities that require lifting, carrying, and arm mobility.

164. Make a table of test items listed under fitness test by SAI (Age group 9-18 yrs). Explain the procedure and scoring of 50 MTS Run and Partial Curl Up.

Ans :

2023-24

Test Item	Description	Measurement
BMI (Body Mass Index)	Calculation based on height and weight to assess body composition.	Numerical value (kg/m ²)
50 m Speed Test	A sprint over a 50-meter distance to evaluate speed and acceleration.	Time in seconds
600 m Run/Walk	A distance test to measure cardiovascular endurance and stamina.	Time in minutes and seconds
Sit & Reach Flexibility Test	A test of lower back and hamstring flexibility by reaching forward while seated.	Distance reached (in cm or inches)
Partial Abdominal Curl-Up	A test of core strength by counting the number of curl-ups performed in a set time period.	Number of repetitions
Push-Ups / Modified Push-Ups	Upper body strength test: standard push-ups for boys and modified push-ups for girls.	Number of repetitions

1. 50 m Speed Test
 - (i) Procedure : The student lines up at the designated start line. On the signal, the student sprints as fast as possible over a 50-meter straight course. A stopwatch is used to record the time from the start signal until the student crosses the finish line. The test is typically performed on a flat, non-slip surface to ensure consistency.
 - (ii) Scoring : The time taken to complete the 50 meters is recorded in seconds. A lower time indicates better sprinting speed and

overall agility. Performance benchmarks may be set according to age and gender to evaluate fitness relative to peers.

2. Partial Abdominal Curl-Up Test

- (i) Procedure: The student lies on a mat with knees bent at a 90-degree angle and feet flat on the ground. The hands are placed on the chest or behind the head as per the test protocol. The student performs a partial curl-up by lifting the shoulders off the mat without fully flexing the spine. The curl-up is done in a controlled manner and is repeated continuously for a set time period (e.g., 30 seconds or one minute).
- (ii) Scoring : The total number of correctly executed partial abdominal curl-ups within the set time is counted. A higher repetition count signifies better core strength and muscular endurance. Form and consistency are essential; only correctly performed curl-ups are counted. Scores may be compared against age and gender-specific standards to assess performance.

165. How Can We Test Motor Educability? Explain in Detail

Ans :

DELHI 2009

Motor educability refers to an individual's capacity to learn, refine, and execute coordinated movements. Testing motor educability typically involves a battery of structured tasks that evaluate various aspects of motor skills. One widely used method is the Johnsen Methney Test of Motor Educability, which consists of several components:

1. Front Roll : The participant performs a controlled forward roll. This assesses core stability, spatial awareness, and overall body coordination.
2. Backward or Lateral Roll : Involves rolling in a different direction to test flexibility and balance. Observations include fluidity of movement and control during the roll.
3. Jumping Half-Turn : The participant jumps and performs a 180-degree turn. This tests dynamic balance, agility, and the ability to quickly alter direction.
4. Jumping Full-Turn : Requires a complete 360-degree rotation in mid-air. It challenges advanced coordination, timing, and spatial orientation.

The evaluator observes each task for smooth execution, proper technique, speed, and balance. Detailed scoring systems are used to assign marks to different aspects of performance. This process not only identifies strengths in motor performance but also highlights areas that may need additional training or intervention. The data gathered helps educators and coaches tailor programs to improve coordination, balance, and overall physical literacy. Regular testing using these tasks can also track improvements over time, ensuring that any delays or deficiencies in motor development are addressed early. In summary, a structured test battery like the Johnsen Methney Test provides a comprehensive evaluation of motor educability by breaking down complex movements into measurable components, offering valuable insights for personalized physical education programming.

166. Discuss Any Three Tests for Testing the Endurance and Agility of Senior Citizens

Ans :

OD 2001

Assessing endurance and agility in senior citizens is essential for maintaining functional independence and reducing the risk of falls. Three commonly used tests are:

1. Chair Stand Test:
 - i. This test evaluates lower body strength and endurance.
 - ii. The participant sits in a standard chair and stands up repeatedly for a set period (usually 30 seconds).
 - iii. The number of complete stands indicates lower limb strength, which is critical for daily activities like climbing stairs or rising from a seated position.
 - iv. Designed to measure agility and dynamic balance.
 - v. The participant starts seated, stands, walks eight feet, turns, and returns to sit as quickly as possible.
 - vi. The total time taken reflects agility and coordination, crucial for preventing falls.
2. Six-Minute Walk Test:
 - i. This test assesses aerobic endurance.
 - ii. The participant walks continuously for six minutes on a flat surface, and the total distance covered is recorded.
 - iii. It provides a practical measure of cardiovascular health and stamina.

Together, these tests offer a comprehensive profile of a senior citizen's physical capabilities.

They are simple, require minimal equipment, and are safe to administer. Results can guide the development of targeted exercise programs aimed at improving strength, balance, and endurance. Regular assessments help monitor progress and adjust training interventions to enhance mobility and overall quality of life in seniors. These tests not only serve as screening tools but also promote awareness about the importance of maintaining physical fitness during aging.

167. Briefly Describe the Test Used for Assessing Aerobic Fitness.

Ans :

FOREIGN 2004

The Harvard Step Test is a widely recognized method for assessing aerobic fitness and cardiovascular endurance. The test is straightforward and can be administered with minimal equipment. Its procedure and calculations are as follows:

1. Procedure:
 - i. A standard platform or step (usually around 50 cm in height) is used.
 - ii. The participant steps up and down at a consistent, pre-determined pace (often set by a metronome or timer).
 - iii. The exercise continues until the participant reaches a point of exhaustion or for a fixed duration, ensuring the heart rate is significantly elevated.
2. Pulse Measurement:
 - i. Immediately after the exercise, the participant's pulse is measured during a recovery period, typically for 1 to 1.5 minutes.
 - ii. This recovery pulse rate is a critical indicator of how quickly the cardiovascular system returns to normal.
 - iii. Fitness Index Calculation : The final fitness index is calculated using the formula:

$$\text{Fitness Index} = \frac{\text{Duration of Exercise in Seconds} \times 100}{5.5 \times \text{Pulse Count}}$$
 - iv. A higher fitness index indicates better aerobic fitness and a more efficient cardiovascular recovery mechanism.

This test is beneficial because it is low-cost, requires little space and equipment, and can be administered to large groups. It is particularly useful in schools, sports clubs, and community settings for regular monitoring of aerobic capacity. By providing a quantitative measure of endurance, the Harvard Step Test helps track improvements

over time and can guide the design of personalized training programs. Its simplicity and effectiveness make it a popular choice for evaluating aerobic fitness across diverse populations.

168. Describe the Procedure of SAI Khelo India Fitness Test

Ans :

DELHI 2020

The SAI Khelo India Fitness Test is designed to evaluate the physical fitness of school children and is divided into two age groups with age-appropriate tests. The test procedure is standardized to ensure consistency and accurate comparisons among participants.

1. For Ages 5-8 Years (Classes 1-3):
 - i. BMI Measurement : Each child's height and weight are measured using standardized equipment, and the Body Mass Index (BMI) is calculated to provide an initial indication of body composition.
 - ii. Flamingo Balance Test : The child is asked to stand on one leg for a specific period while the time maintained is recorded. This test assesses static balance and coordination.
 - iii. Plate Tapping Test : The child is seated, and two plates are placed a short distance apart. The child alternately taps each plate as quickly as possible for a fixed duration to assess hand speed and coordination.
2. For Ages 9-18 Years (Classes 4-12):
 - i. BMI Measurement: continues as above.
 - ii. 50-Meter Speed Test : The child runs 50 meters at full speed, and the time taken is recorded, indicating explosive power and speed.
 - iii. 600-Meter Run/Walk Test : Measures aerobic endurance by timing how long it takes to complete 600 meters.
 - iv. Sit & Reach Flexibility Test : Evaluates lower body flexibility by measuring how far the child can reach while seated.
 - v. Strength Tests : Partial Abdominal Curl Up: assesses core strength.
 - vi. Push-Ups (for boys) or Modified Push-Ups (for girls): measure upper body strength.

This multi-component test provides a comprehensive evaluation of a child's fitness by measuring various physical attributes. Standardized protocols ensure fairness and allow

moves their preferred hand back and forth between the discs as quickly as possible for 25 full cycles (50 taps). The score is the time taken to complete the 25 cycles.

- (b) Assessing fundamental movement skills (FMS) like balance and coordination is crucial for children in the 5-8 years age group because these skills are the essential building blocks for more complex physical activities later in life, such as playing sports and dancing. The Flamingo Balance Test directly measures static balance, which is vital for controlling the body in various situations. The Plate Tapping Test assesses hand-eye coordination and limb speed. By tracking these abilities, teachers can identify developmental needs and ensure that children acquire the foundational skills necessary for a lifetime of healthy physical activity.

- 173.** (a) Define Basal Metabolic Rate (BMR) and explain the factors that can affect it.
(b) Describe how to accurately measure height and weight for calculating BMI, another important fitness metric. Why is it important to measure these parameters correctly for fitness assessment?

Ans :

FOREIGN 2013

- (a) Basal Metabolic Rate (BMR) is the number of calories the body requires to maintain its most basic, life-sustaining functions while at rest. This includes the energy needed for the functioning of internal organs. Several factors can affect an individual's BMR, including their muscle mass, age, gender, genetic makeup, and overall body composition. For instance, individuals with more muscle mass generally have a higher BMR. Environmental factors, such as changes in heat or cold, can also alter the body's energy requirements and thus affect the BMR.
- (b) Accurately measuring height and weight is essential for calculating Body Mass Index (BMI), a key fitness metric.
- i. Height Measurement: The participant should remove their shoes and stand with their feet flat and back against a flat, uncarpeted wall. Their legs should be straight, shoulders level, and they should be looking straight ahead. A flat headpiece should be lowered to the crown of the head to mark the height, which is

then measured with a metal tape from the floor to the mark.

- ii. Weight Measurement: A digital scale should be used on a firm, flat floor. The participant should remove shoes and heavy clothing and stand with both feet in the center of the scale.

It is crucial to measure these parameters correctly because metrics like BMI are used to categorize an individual's weight status (underweight, normal, overweight, obese). Inaccurate measurements will lead to an incorrect BMI calculation, resulting in a flawed assessment of a person's health risks and fitness level.

CASE BASED QUESTION

- 174.** Sports department of ABC school is conducting fitness tests for all the students of the school. Answer the following questions.

- (a) Name the test items for class 1-3.
(b) Name the test items for classes 4-12.
(c) Which tests are common in both the categories 1-3 & 4-12?

Ans :

- (a) Test items for classes 1-3 : Typically, tests for young children focus on basic motor skills. These include a short sprint (e.g., 20-50 m dash), a standing long jump, simple agility tasks (like a modified shuttle run), and flexibility assessments (adapted sit and reach).
- (b) Test items for classes 4-12 : For older students, fitness tests are more comprehensive. They generally include a 50 m sprint for speed, a shuttle run for agility, endurance tests (such as a 600 m run/walk or Harvard step test), strength tests (push-ups, sit-ups), and flexibility tests (sit and reach).
- (c) Common tests for both categories : Both age groups commonly perform basic tests like a short-distance sprint (adjusted as needed), the standing long jump, and the sit and reach test. These evaluate fundamental components—speed, power, and flexibility—suitable for assessing overall fitness in all students.

stability.

- ii. Procedure: The student lies on a cushioned, flat surface with knees flexed at 90 degrees and hands straight by their sides with palms down. They raise their trunk in a smooth motion, curling up a desired amount, and then lower their upper back to the floor.
 - iii. Scoring: The score is the maximum number of correct curl-ups performed in 30 seconds.
4. 600-meter Run/Walk:
- i. Purpose: This test assesses cardiovascular fitness or cardiovascular endurance.
 - ii. Procedure: Participants are instructed to cover the 600-meter distance at the fastest pace possible. Walking is permitted, but the main objective is to complete the distance in the shortest time.
 - iii. Scoring: The score is the elapsed time taken for completion, recorded in minutes and seconds.

- 171.** What is the Harvard Step Test? Explain its purpose, the equipment required, the detailed procedure for conducting the test, and the formula used to calculate the Fitness Index score. Discuss how the scores are interpreted.

Ans :

DELHI 2017

The Harvard Step Test is a physiological test developed by Brouha in 1943 to measure an individual's aerobic fitness and their ability to recover from strenuous work. It is a type of cardiac stress test for detecting and diagnosing cardiovascular disease.

1. Purpose and Equipment : The primary objective is to determine aerobic fitness by having the participant perform a continuous step exercise for 5 minutes or until they are exhausted. The equipment required is simple: a bench or wooden block that is 20 inches in height, a stopwatch to time the exercise and recovery, and a metronome to maintain the stepping pace.
2. Procedure : The participant starts the test on the command "Go". They must step up and down on the bench at a rate of 30 steps per minute, with the metronome set to a four-count rhythm (one foot up, second foot up, first foot down, second foot down). This continues for exactly five minutes unless the participant is unable to maintain the pace and becomes exhausted, in which

case the test is stopped and the duration is recorded. Immediately upon completion, the participant sits down to rest. The tester then counts the participant's heartbeats (pulse) for a 30-second interval, specifically from 1 minute to 1.5 minutes after the exercise has stopped.

3. Scoring and Interpretation : The Fitness Index score is calculated using a specific formula to assess the level of fitness. The formula is:

$$\text{Fitness Index} = (\text{Duration of the Exercise in Seconds} \times 100) / (5.5 \times \text{Pulse count of 1-1.5 min after Exercise}).$$
 The resulting score is interpreted according to the following norms: a score up to 49 is considered "Poor," a score between 50 and 80 is "Average," and a score of 81 or above is rated as "Good".

- 172.** (a) Explain the purpose and procedure for conducting the Flamingo Balance Test and the Plate Tapping Test as part of the SAI Khelo India Fitness Test for the 5-8 years age group.
- (b) Why is it important to assess fundamental movement skills like balance and coordination at this early age, and how do these tests help in doing so?

Ans :

OD 2007

- (a) These two tests are designed to assess key fundamental movement skills in young children.
1. Flamingo Balance Test:
 - i. Purpose: To assess the ability to balance successfully on a single leg, which measures static balance and the strength of the leg, pelvic, and trunk muscles.
 - ii. Procedure: The child stands on a beam on their preferred leg. The free leg is flexed at the knee, and the foot is held close to the buttocks. A stopwatch is started, and it is paused each time the child loses balance by falling off the beam or letting go of their foot. The score is the total number of falls in 60 seconds.
2. Plate Tapping Test:
 - i. Purpose: To test the speed and coordination of limb movement.
 - ii. Procedure: Two discs are placed 60 cm apart on a table, with a rectangle in the middle. The child places their non-preferred hand on the rectangle and

educators to identify strengths and areas for improvement. Data collected through the test help in designing targeted interventions and promoting overall health and physical activity among school children.

169. Write Down the Procedure to Conduct SAI Khelo India Fitness Test in Schools for 5 to 8-Year-Old Students

Ans :

SQP 2018

For students aged 5 to 8 years (Classes 1-3), the SAI Khelo India Fitness Test is designed to be simple, engaging, and effective in assessing basic physical fitness components. The procedure is as follows:

1. BMI Measurement:
 - i. Measure each child's height and weight using calibrated instruments.
 - ii. Calculate the Body Mass Index (BMI) to assess general body composition and identify potential nutritional concerns.
2. Flamingo Balance Test:
 - i. Explain the test to the child in simple terms.
 - ii. Ask the child to stand on one leg while the other leg is slightly raised.
 - iii. Record the time for which the child can maintain this position without support.
 - iv. Repeat the test a couple of times to ensure consistency, and use the average score for assessment.
3. Plate Tapping Test:
 - i. Seat the child comfortably at a table with two plates placed a short distance apart.
 - ii. Instruct the child to alternately tap each plate as quickly as possible for a predetermined time (typically 15-20 seconds).
 - iii. Count the number of taps and record the performance.
4. Environment and Supervision:
 - i. Ensure the testing area is safe, well-lit, and free from distractions.
 - ii. Trained teachers or fitness instructors should supervise the tests to provide clear instructions and support.
5. Documentation and Follow-Up:
 - i. Record all results accurately for each student.
 - ii. Use the data to identify individual strengths and areas needing improvement, and integrate findings into physical

education programs to promote overall fitness.

170. Describe in detail the SAI Khelo India Fitness Test battery for the age group 9-18 years (Class 4-12). Explain the purpose, procedure, and scoring for at least four of the tests included in this battery.

Ans :

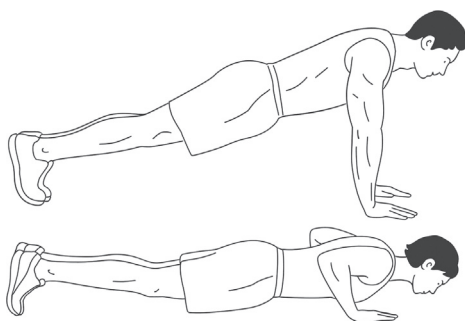
COMP 2020

The SAI Khelo India Fitness Test for the 9-18 years age group is designed to assess the overall physical fitness of school students. It covers five critical components of health and skill-related fitness: Body Composition, Strength, Flexibility, Cardiovascular Endurance, and Speed. The battery provides a comprehensive profile of a student's physical health, helping to identify strengths and areas for improvement. Four key tests from this battery are:

1. 50 Mtr Dash (Standing Start):
 - i. Purpose: This test determines a student's acceleration and speed.
 - ii. Procedure: After a thorough warm-up, the student begins from a stationary standing position with one foot on or behind the starting line. On command, they sprint the 50-meter distance, running hard through the finish line.
 - iii. Scoring: The score is the total time taken to complete the dash, recorded by a stopwatch.
2. Sit and Reach Test:
 - i. Purpose: This is a common measure of flexibility, specifically for the lower back and hamstring muscles. Good flexibility in this area is important for preventing lower back pain.
 - ii. Procedure: The student sits on the floor with shoes removed, legs stretched straight, and the soles of their feet placed flat against the Sit and Reach box. With palms facing down and hands on top of each other, they reach forward along the measuring line as far as possible, holding the position for one to two seconds without jerky movements.
 - iii. Scoring: The score is the distance reached by the hand, recorded in centimeters and millimeters.
3. Partial Curl-up:
 - i. Purpose: This test measures abdominal muscular strength and endurance, which are crucial for back support and core

175. Students of class X were gathered on the playground during their games period and were informed that a fitness test will be conducted for them. Students had some questions related to the test items.

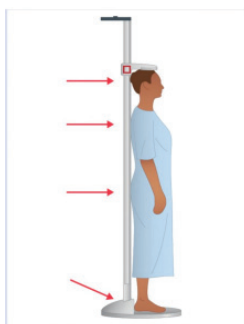
- What is the purpose of conducting Push-ups?
- Which test will be conducted for speed?
- What is the time duration for performing Partial curl ups?



Ans :

- Purpose of conducting Push-ups :** Push-ups measure upper body strength and endurance, particularly targeting the chest, shoulder, and triceps muscles. They also help assess core stability since the body must remain straight throughout the movement, indicating overall muscular fitness.
- Test conducted for speed :** A 50-meter dash (or 50-yard dash) is typically used to evaluate speed. Students sprint from a standing start over a short distance, and their time is recorded to assess explosive acceleration and quickness.
- Time duration for performing Partial Curl-Ups :** In many school fitness protocols, Partial Curl-Ups are performed for 1 minute. Within this set time, students complete as many correct repetitions as possible, measuring abdominal strength and endurance.

176. In reference to the picture answer the following questions :



- Which device is typically used to measure a person's height?
 - Thermometer
 - Stadiometer
 - Goniometer
 - Dynamometer

Ans :

- Stadiometer
- What is the best practice when measuring height?
 - Standing barefoot with heels, buttocks, and shoulders touching the measuring rod
 - Wearing thick-soled shoes and leaning forward
 - Sitting on a stool while measuring
 - Keeping knees bent and looking down at the floor

Ans :

- Standing barefoot with heels, buttocks, and shoulders touching the measuring rod
- Which device is used to measure a person's weight?
 - Caliper
 - Treadmill
 - Weighing scale
 - Thermometer

Ans :

- Weighing scale
- Body Mass Index (BMI) is calculated by:
 - Dividing weight in kilograms by height in centimeters
 - Dividing weight in kilograms by the square of height in meters
 - Subtracting age from weight in pounds
 - Dividing height in meters by weight in kilograms

Ans :

- Dividing weight in kilograms by the square of height in meters

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177. In reference to the picture answer the following questions :



- (i) The fitness test demonstrated in the images is commonly known as:
 (a) Harvard Step Test
 (b) Flamingo Balance Test
 (c) Shuttle Run Test
 (d) Sit and Reach Test

Ans :

- (b) Flamingo Balance Test
 (ii) The primary fitness component measured by this test is:
 (a) Cardiovascular endurance
 (b) Muscular strength
 (c) Balance
 (d) Flexibility

Ans :

- (c) Balance
 (iii) In the standard protocol for this test, the individual:
 (a) Sits cross-legged on the floor
 (b) Balances on a beam or raised surface on one foot while holding the other foot
 (c) Runs back and forth between markers
 (d) Jumps vertically as high as possible

Ans :

- (b) Balances on a beam or raised surface on one foot while holding the other foot
 (iv) One common way to score the Flamingo Balance Test is by:
 (a) Counting the number of successful push-ups in 30 seconds
 (b) Recording the time (in seconds) the participant can maintain balance without falling

- (c) Measuring heart rate recovery after the test
 (d) Adding the number of consecutive squat jumps performed

Ans :

- (b) Recording the time (in seconds) the participant can maintain balance without falling

178. In reference to the picture answer the following questions :



- (i) The fitness component primarily measured by the Partial Curl-Up test is:
 (a) Cardiovascular endurance
 (b) Abdominal muscular endurance
 (c) Upper-body strength
 (d) Flexibility

Ans :

- (b) Abdominal muscular endurance
 (ii) In the standard Partial Curl-Up test protocol, the participant starts in a:
 (a) Prone position, arms overhead
 (b) Supine position, knees bent, feet on the floor
 (c) Standing position with arms folded
 (d) Seated position with legs extended

Ans :

- (b) Supine position, knees bent, feet on the floor
 (iii) During the test, the arms are typically:
 (a) Placed under the head to support the neck
 (b) Stretched straight above the head
 (c) Extended along the sides with fingers touching a measuring strip
 (d) Locked behind the back

Ans :

- (c) Extended along the sides with fingers touching a measuring strip

- (iv) A common way to score the Partial Curl-Up test is by:
- Counting the total number of curl-ups completed in a set time
 - Measuring how far the participant can bend forward
 - Tracking heart rate recovery after the exercise
 - Recording the participant's weight before and after the test

Ans :

- (a) Counting the total number of curl-ups completed in a set time

179. In reference to the picture answer the following questions :



- (i) The fitness component primarily measured by the Sit and Reach test is:
- Muscular strength
 - Flexibility (hamstrings and lower back)
 - Cardiovascular endurance
 - Speed and agility

Ans :

- (b) Flexibility (hamstrings and lower back)
- (ii) In the standard Sit and Reach protocol, the participant:
- Lies down with knees bent
 - Sits with legs fully extended, soles of feet against the box
 - Stands on one foot while touching their toes
 - Bends sideways with arms overhead

Ans :

- (b) Sits with legs fully extended, soles of feet against the box

- (iii) Which piece of equipment is typically used to measure the distance reached in the Sit and Reach test?
- Stopwatch
 - Tape measure or box with a measuring scale
 - Heart rate monitor
 - Balance beam

Ans :

- (b) Tape measure or box with a measuring scale
- (iv) A common way to score the Sit and Reach test is by:
- Counting the number of push-ups completed in one minute
 - Recording the time it takes to reach the toes
 - Measuring how far beyond the toes the fingertips can reach
 - Calculating body mass index (BMI)

Ans :

- (c) Measuring how far beyond the toes the fingertips can reach

180. In reference to the picture answer the following questions :



- (i) The fitness component primarily measured by the Step Test is:
- Flexibility
 - Cardiovascular endurance
 - Muscular strength
 - Reaction time

Ans :

- (b) Cardiovascular endurance
- (ii) In the standard Harvard Step Test protocol, the participant steps up and down on a platform for:
- 30 seconds
 - 1 minute
 - 5 minutes
 - 15 minutes

Ans :

- (c) 5 minutes
- (iii) Which physiological measure is typically recorded to evaluate performance in this test?
 - (a) Waist circumference
 - (b) Heart rate (pulse) recovery
 - (c) Vertical jump height
 - (d) Body temperature

Ans :

- (b) Heart rate (pulse) recovery
- (iv) A common way to score the Harvard Step Test is by:
 - (a) Measuring how high the participant can jump after stepping
 - (b) Counting the total number of steps in 60 seconds
 - (c) Using a fitness index formula that factors in recovery heart rate
 - (d) Calculating the participant's body mass index (BMI)

Ans :

- (c) Using a fitness index formula that factors in recovery heart rate

181. In reference to the picture answer the following questions :



- (i) The primary fitness component measured by the Chair Stand Test is:
 - (a) Upper-body flexibility
 - (b) Lower-body strength and endurance
 - (c) Cardiorespiratory fitness
 - (d) Hand grip strength

Ans :

- (b) Lower-body strength and endurance

- (ii) In the standard protocol for this test, participants:
 - (a) Perform as many sit-to-stand repetitions as possible within 30 seconds
 - (b) Balance on one foot while sitting on the chair
 - (c) Measure their heart rate while seated for 1 minute
 - (d) Lift both arms overhead repeatedly

Ans :

- (a) Perform as many sit-to-stand repetitions as possible within 30 seconds
- (iii) The Chair Stand Test is commonly used to assess:
 - (a) Athletic sprint speed
 - (b) Jumping ability
 - (c) Functional fitness in older adults
 - (d) Swimming endurance

Ans :

- (c) Functional fitness in older adults
- (iv) A typical way to score the Chair Stand Test is by:
 - (a) Calculating body mass index (BMI) after the test
 - (b) Counting how many stands are completed in 30 seconds
 - (c) Measuring the time it takes to run 100 meters
 - (d) Recording the participant's maximum heart rate

Ans :

- (b) Counting how many stands are completed in 30 seconds

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CHAPTER 7

PHYSIOLOGY AND INJURIES IN SPORTS

SUMMARY

1. PHYSIOLOGICAL FACTORS DETERMINING COMPONENTS OF PHYSICAL FITNESS

1.1 Components of Physical Fitness

1. **Cardiorespiratory Endurance** : The ability of the heart, lungs, and blood vessels to deliver oxygen efficiently during prolonged physical activity. High endurance is crucial for activities such as running, swimming, and cycling.
2. **Muscular Strength and Endurance** : Muscular strength refers to the maximum force that a muscle or group of muscles can exert in a single effort, while endurance is the ability to sustain repeated contractions or maintain a continuous contraction over time. These attributes are essential for sports that require power and stamina.
3. **Flexibility** : Flexibility is the range of motion available at a joint. It is influenced by factors such as muscle elasticity, the structure of joints, and connective tissue properties. Good flexibility can enhance performance and reduce the risk of injuries.
4. **Body Composition** : This refers to the relative amounts of muscle, fat, bone, and other tissues in the body. A balanced body composition is crucial for achieving optimal performance and maintaining health.

1.2 Determining Factors

1. **Genetic Makeup** : Inherited traits play a significant role in determining the baseline level of physical fitness. For example, genetics can influence muscle fiber type distribution, aerobic capacity, and the body's ability to recover from exertion.
2. **Physiological Adaptations to Training** : The body adapts to regular physical activity

through structural and functional changes. This includes increased mitochondrial density in muscles, improved oxygen utilization, and enhanced metabolic pathways that facilitate energy production and recovery.

3. **Environmental Conditions** : External factors such as altitude, temperature, and humidity can significantly impact physical performance. Training in high-altitude areas, for instance, can improve oxygen-carrying capacity, while extreme temperatures can affect muscle efficiency and endurance.
4. **Nutritional and Hydration Status** : Adequate nutrition provides the energy and building blocks for muscle repair and growth, while proper hydration is essential for maintaining optimal physiological function. Deficiencies or imbalances can hinder performance and slow recovery.
5. **Psychological Factors** : Mental aspects such as motivation, concentration, stress management, and resilience play a crucial role in physical performance. Psychological preparedness can enhance training outcomes and overall fitness levels.

EFFECT OF EXERCISE ON THE MUSCULAR SYSTEM

2.1 Immediate (Acute) Effects of Exercise

1. **Muscle Contraction and Energy Utilization** : During exercise, muscles undergo repeated contractions, consuming adenosine triphosphate (ATP) as their primary energy source. Immediate energy is provided by stored glycogen and phosphocreatine, which fuels high-intensity activities.
2. **Enhanced Blood Flow** : Exercise increases blood flow to active muscles, ensuring a rapid supply of oxygen and nutrients while facilitating the removal of metabolic byproducts like lactic acid. This process is crucial for sustaining muscle performance

therapy to promote healing and prevent recurrence.

5.2 Bone & Joint Injuries

Injuries to bones and joints are typically more severe and require prompt medical attention.

1. Dislocation
 - (i) Definition : Occurs when a bone is forced out of its normal joint position, resulting in misalignment.
 - (ii) Causes : Commonly caused by a significant impact or fall during sports.
 - (iii) Management : Immediate medical intervention is needed to realign the joint and prevent long-term damage.
2. Fractures : Fractures are breaks or cracks in the bone, and they can be categorized based on the nature and pattern of the break:
 - (i) Green Stick Fracture : An incomplete fracture where the bone bends and cracks rather than breaking completely. This type is more common in children due to the flexibility of their bones.
 - (ii) Comminuted Fracture : A severe break where the bone shatters into several pieces. This injury typically results from high-impact trauma.
 - (iii) Transverse Fracture : A horizontal break across the bone, often resulting from a direct blow or stress on a specific point.
 - (iv) Oblique Fracture : A diagonal break across the bone, usually caused by a combination of bending and twisting forces.
 - (v) Impacted Fracture : Occurs when bone fragments are driven into each other by a forceful impact. This can compromise the structural integrity of the bone and may require surgical intervention.
 - (vi) Management of Fractures : Treatment may involve immobilization using casts or braces, and in severe cases, surgical intervention may be necessary to realign and stabilize the bone.

MULTIPLE CHOICE QUESTION

1. In which of the following fitness component an athlete gives better performance, if he/she has more slow twitch fibre in comparison to fast twitch fibres.
 - (a) Speed
 - (b) Strength
 - (c) Endurance
 - (d) Flexibility

Ans :

2024

(c) Endurance.

Slow-twitch fibers have abundant mitochondria, high myoglobin content, and efficient oxygen utilization, making them ideal for prolonged, aerobic activities. Athletes with more slow-twitch fibers excel in endurance, as these fibers resist fatigue, maintain energy production, and support performance over time.

2. Jump for smash in volleyball is an example of _____.
 - (a) Static strength
 - (b) Maximum strength
 - (c) Explosive strength
 - (d) Strength endurance

Ans :

2024

(c) Explosive strength

Explosive strength refers to the ability to exert maximum force in a very short time. It is crucial for rapid movements like a volleyball jump smash, where quick, powerful muscle contractions generate the necessary force to achieve high vertical lift and swift directional change.

3. Match List 1 and List 2, selecting the correct option :

	List-1		List-2
1.	Abrasion	A.	Joint Injury
2.	Green Stick Fracture	B.	Soft Tissue Injury
3.	Shoulder Dislocation	C.	Cause of Sports Injury
4.	Lack of Fitness	D.	Bone Injury

- 1 2 3 4
- (a) A B C D
- (b) B D A C
- (c) B D C A
- (d) D B A C

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3. Joint Degeneration : Aging can result in the wear and tear of joint cartilage, which may lead to joint pain and stiffness. Conditions like osteoarthritis become more common, impacting mobility and overall quality of life.

4.2 Cardiovascular and Respiratory Changes

1. Diminished Cardiac Performance : The aging heart often exhibits reduced efficiency in pumping blood. This may manifest as decreased cardiac output and a higher susceptibility to cardiovascular diseases, limiting endurance during physical activity.
2. Reduced Lung Function : Aging leads to a decline in lung elasticity and a reduction in respiratory muscle strength. These changes result in decreased lung capacity and slower gas exchange, affecting the overall ability to sustain aerobic exercise.

4.3 Metabolic and Recovery Considerations

1. Metabolic Slowdown : A decline in metabolic rate with age affects energy production and expenditure. This can result in reduced stamina and a slower response to exercise demands.
2. Delayed Recovery : Older individuals typically experience longer recovery periods after exercise or injury. The regenerative capacity of tissues diminishes with age, necessitating modifications in training intensity and duration.
3. Hormonal Changes : Age-related changes in hormone levels, such as decreased production of growth hormone and sex hormones, contribute to muscle loss and decreased energy levels. These hormonal shifts influence overall physical performance and recovery.

5. SPORTS INJURIES : CLASSIFICATION

5.1 Soft Tissue Injuries

Soft tissue injuries involve damage to the skin, muscles, tendons, and ligaments. These injuries are common in sports and can vary in severity.

1. Abrasion
 - (i) Definition : A superficial injury where the outer layer of the skin is scraped off, exposing underlying tissues.
 - (ii) Causes : Typically occur due to friction against rough surfaces, such as falls or sliding during sports activities.

- (iii) Management : Requires cleaning and protection to prevent infection while promoting healing.

2. Contusion

- (i) Definition : Commonly known as a bruise, a contusion is caused by blunt trauma that results in bleeding under the skin.
- (ii) Characteristics : The injury may not break the skin but can cause discoloration, swelling, and pain.
- (iii) Management : Rest, ice, compression, and elevation (RICE) are often recommended to manage symptoms.

3. Laceration

- (i) Definition : A tear or jagged cut in the skin resulting from blunt force trauma that causes the tissue to split.
- (ii) Characteristics : The injury is usually irregular in shape and may involve significant tissue damage.
- (iii) Management : Depending on severity, treatment may include cleaning, suturing, and sometimes antibiotic prophylaxis.

4. Incision

- (i) Definition : A clean, precise cut typically caused by a sharp object such as a knife or glass.
- (ii) Characteristics : Incision wounds are generally smoother and less traumatic than lacerations.
- (iii) Management : Often require proper wound care and sometimes surgical closure to minimize scarring and infection.

5. Sprain

- (i) Definition : Injury to a ligament where the tissue is stretched beyond its normal range or partially torn.
- (ii) Mechanism : Often occurs during twisting or impact that forces a joint beyond its usual range of motion.
- (iii) Management : Treatment usually involves rest, ice, compression, and gradual rehabilitation exercises to restore mobility.

6. Strain

- (i) Definition : Injury to a muscle or tendon due to overexertion, leading to stretching or tearing.
- (ii) Mechanism : Can occur during rapid movements, overuse, or lifting heavy weights without proper technique.
- (iii) Management : Similar to sprains, strains are treated with rest, ice, and physical

24. A sprain is an injury to:

- (a) Muscle
- (b) Tendon
- (c) Ligament
- (d) Bone

Ans :

DELHI 2017

- (c) Ligament

A sprain involves the stretching or tearing of a ligament, which connects bones at a joint. This injury typically occurs from sudden twists or impacts that exceed the ligament's normal range of motion, leading to joint instability and pain.

25. A fracture is an example of injury to

- (a) skin
- (b) soft tissue
- (c) hard tissue
- (d) eyes

Ans :

OD 2007

- (c) Hard tissue

A fracture is a break or crack in a bone, classifying it as a hard tissue injury. Bones are rigid structures, and any disruption in their continuity due to impact or trauma results in fractures, which require appropriate medical management for healing.

26. A soft tissue injury damages

- (a) ligaments and tendons
- (b) bone
- (c) cartilage and muscles
- (d) carpals

Ans :

FOREIGN 2010

- (a) Ligaments and tendons

Soft tissue injuries primarily affect non-bony structures such as ligaments, tendons, muscles, and other connective tissues. These injuries result from overuse, sudden impacts, or excessive stretching, often causing pain, swelling, and reduced mobility.

27. A fracture in which the bone breaks diagonally is called a _____ fracture.

- (a) Greenstick
- (b) Impacted
- (c) Oblique
- (d) Transverse

Ans :

SQP 2015

- (c) Oblique

An oblique fracture is characterized by a diagonal

break across the bone, typically caused by twisting forces. This type of fracture differs from greenstick or transverse fractures, as the break occurs at an angle, complicating the healing process and requiring specific treatment.

28. Which physiological factor is most critical for determining aerobic endurance?

- (a) Lactate threshold
- (b) Flexibility
- (c) VO_2 max
- (d) Muscle strength

Ans :

COMP 2015

- (c) VO_2 max

VO_2 max is the maximum rate at which oxygen is consumed during intense exercise. It is a crucial measure of aerobic capacity, reflecting efficient oxygen delivery and utilization in muscles, and it directly determines an athlete's endurance performance over prolonged activity.

29. Which factor primarily determines muscle strength in athletes?

- (a) Cardiovascular endurance
- (b) Muscle fiber type
- (c) Flexibility
- (d) Basal Metabolic Rate

Ans :

DELHI 2020

- (b) Muscle fiber type

Muscle fiber type determines an individual's strength and power. Fast-twitch fibers generate rapid, high-force contractions while slow-twitch fibers sustain endurance. The proportion of these fibers in muscles critically influences performance in strength-oriented and explosive athletic activities.

30. Which factor is essential for flexibility in the human body?

- (a) Muscle elasticity
- (b) VO_2 max
- (c) Aerobic capacity
- (d) Anaerobic threshold

Ans :

OD 2009

- (a) Muscle elasticity

Muscle elasticity refers to the ability of muscles and tendons to stretch and then return to their original length. Enhanced elasticity is vital for flexibility, reducing injury risk and improving the range of motion required for fluid, coordinated movement during sports.

Ans :

SQP 2020

(b) (1)-B, (2)-D, (3)-A, (4)-C

Abrasion is a soft tissue injury; green stick fracture is a bone injury common in children; shoulder dislocation represents a joint injury; lack of fitness acts as a cause of sports injury. Each pairing associates the injury type with its correct classification accurately.

4. It is the amount of blood pumped out by each side of the heart (actually each ventricle) in 1 minute _____.

- (a) Blood pressure
- (b) Cardiac output
- (c) Blood volume
- (d) Both (a) and (b)

Ans :

2023-24

(b) Cardiac output

Cardiac output is the volume of blood pumped by a ventricle per minute. It reflects cardiovascular efficiency by combining heart rate and stroke volume, showing how effectively the heart delivers blood to fulfill the body's metabolic demands. This measurement matters.

5. The irregular tear-like wounds caused by some blunt trauma _____.

- (a) Laceration
- (b) Contusion
- (c) Abrasion
- (d) Incision

Ans :

2023-24

(a) Laceration

Lacerations are irregular, tear-like wounds caused by blunt force trauma that splits the skin and underlying tissues. Unlike clean cuts, lacerations are jagged, often accompanied by tissue damage, and require proper medical care to prevent infection and promote healing effectively.

6. Gliding movement occurs at which joint?

- (a) Knee
- (b) Hip
- (c) Wrist
- (d) Elbow

Ans :

Term-I, 2021-22

(c) Wrist

Gliding movements involve the sliding of one bone over another within a joint. In the wrist, this movement occurs at the carpal bones, allowing a range of subtle adjustments essential for hand dexterity and fine motor control in various tasks.

7. _____ system provide energy during 5000m race.

- (a) ATP CP system
- (b) Anaerobic System
- (c) Aerobic System
- (d) Endurance System

Ans :

COMP 2017

(c) Aerobic System

For a 5000 m race, the aerobic system predominates because it efficiently utilizes oxygen to metabolize carbohydrates and fats over an extended duration. This system provides sustained energy for endurance events, unlike the brief burst provided by anaerobic or ATP-CP systems.

8. Slow twist fibres are of _____ colour.

- (a) Red
- (b) White
- (c) Black
- (d) Blue

Ans :

DELHI 2009

(a) Red

Slow-twitch fibers appear red due to their high myoglobin content, which binds oxygen. This characteristic enables sustained aerobic metabolism, making them ideally suited for endurance activities, as they resist fatigue and efficiently support prolonged muscle contraction.

9. VO_2 max is related to _____.

- (a) Muscular system
- (b) Respiratory system
- (c) Cardiovascular system
- (d) Energy production system

Ans :

OD 2001

(c) Cardiovascular system

VO_2 max, the maximal oxygen uptake, primarily reflects the capacity of the cardiovascular system. It indicates how effectively the heart, blood vessels, and lungs work together to transport and deliver oxygen to working muscles during sustained exercise.

10. Which is NOT a property of muscles?

- (a) Contractility
- (b) Excitability
- (c) Extensibility
- (d) Durability

Ans :

FOREIGN 2004

(d) Durability

Muscles possess contractility, excitability, and

extensibility. However, durability is not recognized as a typical muscle property because it implies long-term resistance to wear, whereas muscles are primarily evaluated for their ability to contract, respond to stimuli, and stretch.

11. Which is not a long term effects of exercise on muscular system?

- (a) Hypertrophy of muscle
- (b) Increased metabolism
- (c) Increased Myoglobin
- (d) Increased blood supply

Ans :

SQP 2007

- (b) Increased metabolism

Long-term exercise adaptations in muscles include hypertrophy, increased myoglobin, and enhanced blood supply. In contrast, increased metabolism is a short-term response seen during and immediately after exercise rather than a sustained adaptation in the muscular system over time.

12. Which is not a short term effects of exercise on muscular system?

- (a) Accumulation of Lactate
- (b) Micro-tears in muscle fibers
- (c) Increase muscle temperature
- (d) Increase in lactate acid tolerance

Ans :

COMP 2003

- (d) Increase in lactate acid tolerance

Short-term exercise effects include lactate accumulation, micro-tears in muscle fibers, and increased muscle temperature. An increase in lactate acid tolerance develops gradually through training adaptations and is considered a long-term effect, not an immediate response to exercise.

13. Physical activity helps to increase _____.

- (a) size of muscle
- (b) size of bone
- (c) size of brain
- (d) size of liver

Ans :

DELHI 2008

- (a) Size of muscle

Regular physical activity, especially resistance training, promotes muscle hypertrophy, resulting in an increased muscle size. Although exercise benefits bones, the primary observable change in response to consistent training is the growth and strengthening of muscle tissue.

14. Increase in glycogen stored in muscle is an effect of _____

- (a) Aerobic Training
- (b) Anaerobic Training
- (c) Cross Training
- (d) Multi training

Ans :

OD 2006

- (a) Aerobic Training

Aerobic training enhances the muscle's ability to store glycogen due to improved oxidative metabolism and increased mitochondrial density. This adaptation ensures that muscles have an ample energy reserve during prolonged activities, thereby improving endurance performance over time.

15. The resting Cardiac output is approximately.

- (a) 10.0 lt.
- (b) 1.0 lt.
- (c) 5.0 lt.
- (d) 15.0 lt

Ans :

FOREIGN 2002

- (c) 5.0 lt.

At rest, a healthy adult's heart typically pumps around 5.0 liters of blood per minute. This resting cardiac output reflects the efficiency of the cardiovascular system under non-stress conditions, ensuring vital organs receive adequate blood supply during minimal activity.

16. The volume of blood pumped during one beat (contraction) is called :

- (a) Blood flow
- (b) Stroke volume
- (c) Veins and arteries
- (d) Capillaries

Ans :

SQP 2010

- (b) Stroke volume

Stroke volume is the volume of blood ejected from the heart with each contraction. It is a crucial measurement of cardiac performance, directly influencing overall cardiac output, as it represents the heart's capacity to deliver oxygenated blood with every beat.

17. Cardiac hypertrophy is

- (a) plateauing of heart rate due to maximal exercise intensity
- (b) enlargement of heart due to chronic endurance training
- (c) lowering of heart rate due to physical training
- (d) increase in ventricular volume because of exercise

Ans :

COMP 2012

(b) Enlargement of heart due to chronic endurance training

Cardiac hypertrophy refers to the physiological enlargement of the heart, especially the ventricles, as an adaptation to chronic endurance training. This structural change enhances the heart's pumping efficiency, allowing for improved cardiac output during prolonged periods of physical activity.

18. The amount of breath per minute increases during exercise to:

- (a) 20 breath per minute
- (b) 40 breath per minute
- (c) 30 breath per minute
- (d) 10 breath per minute

Ans :

COMP 2005

(b) 40 breath per minute

During exercise, the respiratory rate increases to meet the heightened oxygen demand and to eliminate carbon dioxide effectively. Typically, the breathing rate can rise to around 40 breaths per minute during moderate to intense exercise, optimizing gas exchange.

19. Men and women usually attain their highest strength levels between the ages of

- (a) 1 and 2
- (b) 5 and 7
- (c) 7 and 11
- (d) 20 and 40

Ans :

DELHI 2019

(d) 20 and 40

Both men and women generally reach their peak strength levels between the ages of 20 and 40. During this period, hormonal profiles, muscle mass, and overall neuromuscular coordination are optimal, leading to maximum strength and performance capabilities.

20. It is a measure of the amount of minerals (mostly calcium and phosphorous) contained in a certain volume of bone :

- (a) Body composition
- (b) Bone Mass
- (c) Pulmonary function
- (d) Neural function

Ans :

OD 2014

(b) Bone Mass

Bone mass measures the mineral content,

primarily calcium and phosphorus, within a specific volume of bone. This metric is a key indicator of bone strength and density, essential for assessing skeletal health and the risk of fractures or osteoporosis.

21. The chemical substances synthesized by specific host glands, secreted into the blood, and carried throughout the body are called

- (a) hormones
- (b) sugar
- (c) electrolytes
- (d) capillaries

Ans :

FOREIGN 2016

(a) Hormones

Hormones are chemical messengers synthesized by specific glands, released into the bloodstream, and distributed throughout the body. They regulate diverse physiological functions such as growth, metabolism, and homeostasis, playing a crucial role in maintaining overall body function.

22. It is a disease in which bone weakening increases the risk of a broken bone

- (a) Measles
- (b) Osteoporosis
- (c) Atherosclerosis
- (d) Beriberi

Ans :

SQP 2018

(a) Hormones

Hormones are chemical messengers synthesized by specific glands, released into the bloodstream, and distributed throughout the body. They regulate diverse physiological functions such as growth, metabolism, and homeostasis, playing a crucial role in maintaining overall body function.

23. Decrease in size of a body part, cell, organ, or other tissue is called

- (a) Myopia
- (b) Atrophy
- (c) Cardiac arrest
- (d) Cardiac cycle

Ans :

COMP 2020

(b) Atrophy

Atrophy refers to the decrease in size or wasting away of a body part, cell, organ, or tissue. It commonly results from disuse, aging, or pathological conditions, leading to reduced functionality and structural deterioration over time.

during prolonged activity.

3. **Neuromuscular Activation** : The nervous system rapidly communicates with muscles to coordinate movement. This results in improved motor unit recruitment and synchronization, enhancing muscle performance even during short bursts of activity.

2.2 Chronic Adaptations to Regular Exercise

1. **Muscle Hypertrophy and Strength Gains**: Consistent resistance training leads to muscle hypertrophy, which is an increase in muscle fiber size and strength. This adaptation is primarily driven by mechanical stress, which signals the muscle fibers to grow and repair.
2. **Improved Metabolic Efficiency** : With regular exercise, muscles become more efficient in utilizing oxygen and fuel sources. There is an increase in the number and functionality of mitochondria, which enhances the aerobic energy production capacity.
3. **Enhanced Endurance and Fatigue Resistance**: Aerobic training stimulates adaptations that delay the onset of fatigue, such as improved capillary density and greater oxidative enzyme activity. These changes allow muscles to sustain activity for longer periods.
4. **Neuromuscular Coordination** : Long-term exercise improves the communication between the nervous system and muscles, resulting in better coordination and reduced risk of injury. This improved coordination is particularly beneficial in sports requiring complex movements.

3. EFFECT OF EXERCISE ON THE CARDIO-RESPIRATORY SYSTEM

3.1 Cardiac Adaptations

1. **Heart Rate and Stroke Volume Adjustments**: Exercise triggers an increase in heart rate during physical activity. With regular training, the heart becomes more efficient, and stroke volume (the amount of blood pumped per beat) increases. This leads to a lower resting heart rate and an enhanced capacity to supply oxygen to tissues.
2. **Increased Cardiac Output** : The combined effect of a higher heart rate during exercise and an increased stroke volume results in improved cardiac output. A more efficient heart can pump a greater volume of blood, which is essential for supporting sustained

physical activity.

3. **Structural Changes in the Heart** : Over time, regular endurance training can lead to beneficial cardiac remodeling. This may include mild enlargement of the heart chambers and thicker heart walls, allowing for more effective blood circulation.

2.2 Respiratory Adaptations

1. **Enhanced Lung Capacity and Ventilation**: Regular physical activity increases lung capacity and tidal volume (the amount of air inhaled or exhaled per breath). These adaptations improve the efficiency of gas exchange in the lungs.
2. **Improved Oxygen Uptake and Diffusion**: Exercise enhances the diffusion capacity of the lungs, enabling more efficient oxygen uptake into the bloodstream. This improvement is partly due to an increased surface area in the alveoli and enhanced pulmonary capillary blood flow.
3. **Efficient Removal of Metabolic Waste**: Alongside improved oxygen delivery, the respiratory system also becomes more efficient at eliminating carbon dioxide and other metabolic waste products. This helps maintain acid-base balance and reduces fatigue during prolonged exercise.
4. **Adaptation to Increased Demand** : As the intensity and duration of exercise increase, the respiratory system adapts to meet the higher oxygen demands. This is seen in the increased respiratory rate and better coordination between breathing and physical exertion.

4. PHYSIOLOGICAL CHANGES DUE TO AGING

4.1 Musculoskeletal Changes

1. **Sarcopenia** : Aging is accompanied by a natural loss of muscle mass and strength, known as sarcopenia. This process is marked by a reduction in the number and size of muscle fibers, which can affect overall physical performance and increase susceptibility to injury.
2. **Bone Density and Strength** : With age, bone density tends to decrease, leading to conditions such as osteoporosis. Reduced bone mass makes bones more fragile and increases the risk of fractures, especially during high-impact activities.

31. Which exercise modality primarily leads to muscle hypertrophy?

- (a) Resistance training
- (b) Aerobic exercise
- (c) Flexibility training
- (d) Balance exercises

Ans :

FOREIGN 2003

- (a) Resistance training

Resistance training leads to muscle hypertrophy by generating mechanical tension and metabolic stress. This process stimulates muscle fiber growth, increasing muscle mass, strength, and endurance. Such adaptations are fundamental for enhancing performance in strength and power sports.

32. What effect does regular exercise have on the muscular system?

- (a) Decreases muscle mass
- (b) Increases muscle strength and endurance
- (c) Reduces blood flow
- (d) Impairs neuromuscular coordination

Ans :

SQP 2012

- (b) Increases muscle strength and endurance

Exercise increases muscle strength and endurance by inducing hypertrophy, enhancing neuromuscular coordination, and improving metabolic capacity. These adaptations result in greater force production and resistance to fatigue, which ultimately improves overall muscular performance during physical activities.

33. Which effect does exercise have on the cardiorespiratory system?

- (a) Decreases oxygen uptake
- (b) Increases heart rate and oxygen uptake
- (c) Reduces lung capacity
- (d) Lowers ventilation rate

Ans :

COMP 2019

- (b) Increases heart rate and oxygen uptake

Exercise increases heart rate and oxygen uptake because the cardiorespiratory system responds by pumping more blood and elevating ventilation. These adaptations improve aerobic capacity, support sustained physical activity, and enhance overall endurance during exercise effectively.

34. Which physiological change is commonly observed with aging?

- (a) Increased muscle mass
- (b) Reduced aerobic capacity
- (c) Enhanced flexibility
- (d) Faster recovery

Ans :

DELHI 2020

- (b) Reduced aerobic capacity

Aging is commonly associated with reduced aerobic capacity due to declining heart efficiency, lower lung function, and diminished muscle oxidative capacity. These changes result in decreased endurance and slower recovery, making physical activity more challenging as individuals age significantly.

35. Which soft tissue injury is characterized by a scrape on the skin?

- (a) Laceration
- (b) Contusion
- (c) Abrasion
- (d) Incision

Ans :

OD 2001

- (c) Abrasion

An abrasion is a soft tissue injury characterized by a scrape on the skin caused by friction with a rough surface. Although usually minor, abrasions require proper cleaning and care to prevent infection and promote healing without complications.

36. Which soft tissue injury involves a tear of the muscle or tendon fibers?

- (a) Abrasion
- (b) Strain
- (c) Contusion
- (d) Incision

Ans :

FOREIGN 2008

- (b) Strain

A strain is an injury that involves the stretching or tearing of muscle fibers or tendons, typically resulting from overexertion or improper movement. This injury causes pain, swelling, and impaired function, and requires rest and rehabilitation for effective recovery.

37. Which soft tissue injury results from blunt force trauma causing internal bleeding?

- (a) Laceration
- (b) Abrasion
- (c) Contusion
- (d) Incision

Ans :

SQP 2005

- (c) Contusion

A contusion, commonly known as a bruise, results from blunt force trauma causing damage to capillaries and internal bleeding. It leads to swelling, discoloration, and pain, and usually

heals with rest and proper care without requiring surgical intervention.

- 38.** Which bone injury is classified as an incomplete fracture often seen in children?

(a) Comminuted
(b) Transverse
(c) Greenstick
(d) Impacted

Ans :

COMP 2014

(c) Greenstick

A greenstick fracture is an incomplete break in a bone, common in children, where the bone bends and cracks without breaking completely. This injury heals faster due to the bone's flexibility and the lower stresses experienced by pediatric bones during activity.

- 39.** Which bone injury involves the bone breaking into multiple fragments?

(a) Impacted
(b) Greenstick
(c) Comminuted
(d) Transverse

Ans :

DELHI 2004

(c) Comminuted

A comminuted fracture involves the bone breaking into several fragments due to high-energy impact. This severe injury typically requires complex treatment, sometimes surgical intervention, and presents significant challenges in healing and rehabilitation for athletes with such fractures.

- 40.** Which bone injury is characterized by a straight horizontal break across the bone?

(a) Transverse
(b) Oblique
(c) Impacted
(d) Greenstick

Ans :

OD 2002

(a) Transverse

A transverse fracture is characterized by a straight horizontal break across the bone resulting from a direct impact. This fracture is typically simple, and proper alignment and stabilization during recovery are essential for effective bone regeneration over time.

- 41.** Which bone injury is characterized by a diagonal break across the bone?

(a) Transverse
(b) Oblique

(c) Impacted
(d) Greenstick

Ans :

FOREIGN 2013

(b) Oblique

An oblique fracture is characterized by a diagonal break across the bone, usually resulting from twisting forces. It requires precise alignment for proper healing, and may often need surgical fixation to ensure that the bone heals correctly and recovers full functionality.

- 42.** Which bone injury involves one fragment being driven into another?

(a) Impacted
(b) Greenstick
(c) Transverse
(d) Oblique

Ans :

SQP 2016

(a) Impacted

An impacted fracture occurs when one bone fragment is driven into another due to compressive forces. This injury complicates alignment and healing, often requiring careful management or surgical intervention to realign the bone properly for effective recovery in athletes.

- 43.** Which soft tissue injury is characterized by a clean cut with smooth edges?

(a) Laceration
(b) Abrasion
(c) Incision
(d) Contusion

Ans :

COMP 2009

(c) Incision

An incision is a soft tissue injury characterized by a clean cut with smooth, even edges typically produced by a sharp object. This injury generally requires suturing and proper wound care to ensure minimal scarring and prompt healing without complications.

- 44.** Which soft tissue injury involves a tear with irregular edges due to blunt trauma?

(a) Incision
(b) Laceration
(c) Abrasion
(d) Contusion

Ans :

DELHI 2003

(b) Laceration

A laceration is a soft tissue injury involving a tear with irregular, jagged edges, typically resulting

from blunt force trauma. It can cause significant tissue damage and requires thorough cleaning and possible suturing to promote proper healing and reduce the risk of infection.

- 45.** Which soft tissue injury results from friction that superficially damages the skin?
- Abrasion
 - Laceration
 - Contusion
 - Incision

Ans :

OD 2012

- (a) Abrasion

An abrasion results from friction against a rough surface, causing superficial damage to the skin. Although it typically involves only the outer skin layers, proper cleaning and care are essential to prevent infection and promote efficient healing of the injured area.

- 46.** Which soft tissue injury is best described as a bruise caused by blunt trauma?
- Contusion
 - Abrasion
 - Laceration
 - Incision

Ans :

FOREIGN 2019

- (a) Contusion

A contusion is a bruise caused by blunt trauma that leads to capillary damage and internal bleeding. This injury causes discoloration, swelling, and pain, and while usually self-resolving, it requires appropriate rest and care to ensure safe recovery without complications.

- 47.** Which bone and joint injury involves the displacement of bones from their normal alignment?
- Fracture
 - Dislocation
 - Impacted fracture
 - Greenstick fracture

Ans :

SQP 2001

- (b) Dislocation

A dislocation involves the displacement of bones from their normal joint alignment, typically caused by a sudden trauma. This injury leads to joint instability, severe pain, and impaired movement, and requires prompt medical intervention to realign and stabilize the affected joint.

- 48.** Which fracture is most common in children, where the bone bends without completely breaking?
- Comminuted
 - Transverse
 - Greenstick
 - Oblique

Ans :

COMP 2008

- (c) Greenstick

A greenstick fracture is most common in children, occurring when the bone bends and cracks without breaking completely. This incomplete fracture heals relatively quickly due to the inherent flexibility of young bones and the reduced mechanical stress they experience compared to adult bones.

- 49.** Which fracture is characterized by the bone breaking into multiple fragments?
- Greenstick
 - Comminuted
 - Transverse
 - Impacted

Ans :

DELHI 2005

- (b) Comminuted

A comminuted fracture is characterized by the bone breaking into multiple fragments as a result of high-energy trauma. This complex injury often requires surgical intervention and prolonged rehabilitation due to the difficulty in aligning multiple bone pieces for proper healing and functional recovery.

- 50.** Which fracture type features a straight, horizontal break across the bone?
- Oblique
 - Transverse
 - Impacted
 - Greenstick

Ans :

OD 2014

- (b) Transverse

A transverse fracture features a straight, horizontal break across the bone, typically caused by a direct impact. Proper alignment and stabilization are essential for healing this simple fracture type, allowing the bone to regenerate and restore structural integrity over time effectively.

- 51.** Which fracture type results when the bone is crushed and compressed under high force?
- Impacted
 - Transverse
 - Oblique
 - Greenstick

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2011

(a) Both A and R are true, and R is the correct explanation for A

The assertion correctly lists types of soft tissue injuries. The reason accurately distinguishes among these injuries by their causative mechanisms, confirming that each type has a distinct pathophysiology and thereby serving as a correct explanation for the assertion.

- 71. Assertion (A) :** Sprains refer to injuries of ligaments, while strains are injuries involving muscles or tendons.

Reason (R) : Sprains are generally more severe than strains because ligaments have a limited capacity to heal compared to muscles.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2013

(c) A is true but R is false

The assertion is correct in distinguishing sprains from strains. However, the reason is false because the severity of an injury depends on the specific damage incurred; not all sprains are more severe than strains, as both can vary widely in intensity and recovery potential.

- 72. Assertion (A) :** Bone and joint injuries in sports, such as dislocations and fractures, are classified based on the nature and mechanism of injury.

Reason (R) : Fractures like greenstick, comminuted, transverse, oblique, and impacted all result from the same mechanical forces acting on bone tissue.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2015

(c) A is true but R is false

The assertion is correct as injuries are classified by injury type and mechanism. The reason is false because different fracture types occur due to varied forces and patterns of bone failure; they do not all result from identical mechanical forces, making the statement inaccurate.

- 73. Assertion (A) :** Regular exercise induces beneficial adaptations in the muscular and cardiorespiratory systems, reducing injury risk when performed with proper technique and adequate recovery.

Reason (R) : Inadequate recovery and poor technique are the primary contributors to sports injuries, regardless of the beneficial adaptations induced by exercise.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2019

(b) Both A and R are true, but R is not the correct explanation for A

The assertion is true, as proper exercise fosters adaptations that lower injury risk. The reason is also true—injuries often stem from insufficient recovery and faulty technique. However, the reason complements rather than directly explains the assertion, making it true but not the direct explanation.

- 74. Based on the image, what type of wound is shown on the knee?**



- (a) Incision
- (b) Laceration
- (c) Abrasion
- (d) Puncture

Ans :

DELHI 2014

(c) Abrasion

58. Which physiological factor is critical for muscle endurance?

(a) Anaerobic threshold
(b) Mitochondrial density
(c) Flexibility
(d) Basal Metabolic Rate

Ans :

COMP 2017

(b) Mitochondrial density

Mitochondrial density in muscle cells is critical for endurance as it determines the capacity for aerobic ATP production. Higher density improves energy supply during prolonged activity, delaying fatigue and supporting sustained muscle performance, thereby significantly enhancing overall endurance remarkably.

59. Which parameter is measured by the Harvard Step Test to assess cardiorespiratory fitness?

(a) Cardiac recovery rate
(b) Muscle strength
(c) Flexibility
(d) VO_2 max

Ans :

DELHI 2009

(a) Cardiac recovery rate

The Harvard Step Test measures cardiorespiratory fitness by evaluating the cardiac recovery rate. It calculates how quickly heart rate returns to baseline after exercise, reflecting the efficiency of the cardiovascular system in coping with physical stress and supporting endurance during strenuous activity.

60. Which factor does NOT directly influence Basal Metabolic Rate (BMR)?

(a) Age
(b) Weight
(c) Height
(d) Flexibility

Ans :

OD 2001

(d) Flexibility

Basal Metabolic Rate (BMR) is directly influenced by age, weight, and height, as well as gender, but not by flexibility. Flexibility does not contribute to resting energy expenditure and is therefore not considered when calculating the minimum calories required for basic metabolic functions.

61. Match the muscle fiber type or energy system in List-I with the sporting event where it is most dominant in List-II.

	List-I (Fiber/System)		List-II (Dominant Sport/Activity)
(a)	Slow-twitch fibers	(i)	Weightlifting
(b)	Fast-twitch fibers	(ii)	Long-distance running
(c)	ATP-CP System	(iii)	Marathon race
(d)	Aerobic System	(iv)	100 m Sprint

Select the correct option from the following:

(A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(B) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(C) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
(D) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

Ans :

FOREIGN 2004

(A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Slow-twitch fibers are fatigue-resistant and dominant in endurance sports like long-distance running. Fast-twitch fibers are for explosive power, essential for a 100 m sprint. The ATP-CP system provides immediate energy for short, maximal efforts like weightlifting. The aerobic system provides sustained energy for very long events like a marathon.

62. Match the cardiovascular term in List-I with its correct description in List-II.

	List-I (Term)		List-II (Description)
(a)	Cardiac Output	(i)	An increase in the size and strength of the heart due to training
(b)	Stroke Volume	(ii)	A long-term decrease in resting heart rate due to exercise.
(c)	Cardiac Hypertrophy	(iii)	The volume of blood pumped from the heart during one beat.
(d)	Bradycardia	(iv)	The amount of blood pumped by the heart in one minute.

Select the correct option from the following:

- (A) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (B) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (C) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
 (D) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

Ans :

SQP 2007

- (C) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

Cardiac output is the total blood pumped per minute. Stroke volume is the blood pumped per beat. Cardiac hypertrophy is the increase in heart size from training. Bradycardia is the term for a decreased resting heart rate, which is a long-term effect of exercise.

63. Match the soft tissue injury in List-I with its accurate description in List-II.

	List-I (Injury)		List-II (Description)
(a)	Abrasion	(i)	An irregular tear-like wound caused by blunt trauma.
(b)	Contusion	(ii)	An injury to a muscle or a tendon, often from overuse or force.
(c)	Laceration	(iii)	An injury caused by falling or scraping against a rough surface.
(d)	Strain	(iv)	A bruise caused by a direct blow, crushing underlying muscle fibers.

Select the correct option from the following:

- (A) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
 (B) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
 (C) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 (D) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

Ans :

COMP 2003

- (B) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

An abrasion is a scrape from a rough surface. A contusion is a bruise from a direct blow. A laceration is an irregular tear in the skin from blunt trauma. A strain is an injury affecting a muscle or tendon.

64. Match the type of bone fracture in List-I with its defining characteristic in List-II.

List-I (Fracture Type)		List-II (Characteristic)	
(a)	Greenstick	(i)	A straight break directly across the bone.
(b)	Comminuted	(ii)	The bone breaks diagonally.
(c)	Transverse	(iii)	An incomplete fracture where the bone bends and cracks, common in children.
(d)	Oblique	(iv)	The bone is broken or crushed into multiple pieces.

Select the correct option from the following:

- (A) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (B) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
 (C) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
 (D) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

Ans :

DELHI 2008

- (B) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

A Greenstick fracture is an incomplete break where the bone bends. A Comminuted fracture involves the bone breaking into many pieces. A Transverse fracture is a straight break across the bone. An Oblique fracture is one where the bone breaks diagonally.

65. Match the physiological change due to ageing in List-I with the body system it primarily affects in List-II.

List-I (Physiological Change)		List-II (Affected System/Area)	
(a)	Osteoporosis	(i)	Endocrine System
(b)	Somatopause	(ii)	Neural Function
(c)	Reduced Nerve Conduction Velocity	(iii)	Cardiovascular Function
(d)	Decrease in Cardiac Output	(iv)	Bone Mass

Select the correct option from the following:

- (A) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
 (B) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (C) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
 (D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

Ans :

OD 2006

(D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

Osteoporosis is a loss of Bone Mass common with ageing. Somatopause, a decrease in growth hormone, is a change in the Endocrine System. A decline in Nerve Conduction Velocity affects Neural Function. A lower maximum Cardiac Output is a change in Cardiovascular Function.

- 66. Assertion (A) :** Components of physical fitness—such as muscular strength, endurance, flexibility, and cardiovascular capacity—are determined by a combination of genetic, nutritional, and training factors.

Reason (R) : Genetic factors are the sole determinant of an individual's potential for physical fitness.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

FOREIGN 2002

(c) A is true but R is false

The assertion is correct because physical fitness depends on multiple factors. However, the reason is false; while genetics play a role, nutrition, training, and lifestyle also significantly influence fitness, making it inaccurate to claim that genetics are the sole determinant.

- 67. Assertion (A) :** Regular exercise produces muscular adaptations such as hypertrophy and improved endurance.

Reason (R) : Exercise stimulates protein synthesis and increases mitochondrial density in muscle fibers.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

SQP 2010

(a) Both A and R are true, and R is the correct explanation for A

The assertion is correct since resistance and endurance training lead to muscle hypertrophy and improved endurance. The reason accurately explains that these changes occur through enhanced protein synthesis and mitochondrial

biogenesis, making it the proper explanation for the observed muscular adaptations.

- 68. Assertion (A) :** Cardiovascular exercise improves heart efficiency by increasing stroke volume.

Reason (R) : An increased stroke volume means the heart pumps more blood per beat, allowing for a lower heart rate to maintain the same cardiac output.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

COMP 2012

(a) Both A and R are true, and R is the correct explanation for A

The assertion correctly notes that cardiovascular training enhances stroke volume. The reason further explains that a higher stroke volume reduces the need for a rapid heart rate to sustain cardiac output, making both statements true and logically connected.

- 69. Assertion (A) :** Aging is associated with declines in maximal aerobic capacity and muscle mass.

Reason (R) : Diminished mitochondrial function and hormonal changes with age contribute to decreased physical performance.

- (a) Both A and R are true, and R is the correct explanation for A.
 (b) Both A and R are true, but R is not the correct explanation for A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Ans :

DELHI 2005

(a) Both A and R are true, and R is the correct explanation for A

The assertion is true because aging leads to reduced aerobic capacity and muscle mass. The reason correctly identifies underlying factors such as decreased mitochondrial efficiency and hormonal changes, which contribute to the decline in physical performance seen in older adults.

- 70. Assertion (A) :** Soft tissue injuries in sports include abrasions, contusions, and lacerations.

Reason (R) : These injuries differ by mechanism: abrasions result from scraping, contusions from blunt force, and lacerations from sharp force trauma.

Additionally, proper nutrition, adequate recovery, and regular health monitoring are essential to counteract age-related declines.

- 93.** How do physiological factors such as VO_2 max, muscle strength, flexibility, and body composition collectively determine an athlete's physical fitness?

Ans : DELHI 2008

1. VO_2 max: Determines aerobic capacity and endurance.
2. Muscle Strength: Influences power, speed, and overall performance through resistance and training adaptations.
3. Flexibility: Enhances the range of motion and helps prevent injuries.
4. Body Composition: Affects energy expenditure, mobility, and overall health.

- 94.** Describe both the immediate and long-term effects of exercise on muscle tissue.

Ans : OD 2006

1. Immediate Effects: Increased blood flow, energy utilization, and temporary muscle fatigue.
2. Long-Term Effects: Muscle hypertrophy, improved strength, enhanced metabolic efficiency, and increased endurance due to adaptations such as fiber type transformation and mitochondrial biogenesis.

Together, these effects lead to improved performance and reduced risk of injury over time.

- 95.** Analyze the role of the cardiorespiratory system in exercise performance and explain how its function improves with regular training.

Ans : FOREIGN 2002

1. Role: The cardiorespiratory system supplies oxygen to muscles, removes carbon dioxide, and helps regulate body temperature during exercise.
2. Improvements with Training: Enhanced heart efficiency (higher stroke volume, lower resting heart rate), increased lung capacity, and better oxygen exchange at the tissue level lead to improved endurance and overall performance.

- 96.** What are the key physiological changes due to aging, and what implications do these changes have for exercise prescription in older athletes?

Ans :

SQP 2010

1. Key Changes: Reduced muscle mass, diminished cardiovascular function, decreased flexibility, and slower metabolic rate.
2. Implications: Exercise programs for older athletes should focus on low-impact activities, strength training with proper recovery, flexibility exercises, and aerobic conditioning tailored to their reduced capacity. These adaptations help maintain functionality, reduce injury risk, and improve quality of life.

- 97.** Discuss how the interplay of physiological factors like VO_2 max, muscle strength, flexibility, and body composition influences an athlete's performance and training potential.

Ans :

COMP 2012

1. Interplay: High VO_2 max ensures effective oxygen delivery for endurance, robust muscle strength supports power and speed, adequate flexibility minimizes injury risk and an optimal body composition enhances overall efficiency.
2. Training Potential: By assessing these factors, coaches can design targeted training programs that address specific weaknesses and maximize strengths, leading to improved performance and reduced injury risk.

- 98.** Evaluate the acute and chronic effects of exercise on the muscular system and how these adaptations benefit performance.

Ans :

DELHI 2005

1. Acute Effects: Immediate muscle contraction, increased blood flow, and energy consumption.
2. Chronic Adaptations: Increased muscle fiber size (hypertrophy), improved neuromuscular coordination, and enhanced metabolic enzyme activity.
3. Benefits: These adaptations translate into greater strength, endurance, and quicker recovery times, all of which are vital for sustained performance and competitive advantage.

- 99.** Explain the vital role of the cardiorespiratory system during exercise and describe how regular aerobic training enhances its function.

Ans :

OD 2011

1. Role: It ensures the delivery of oxygen and removal of waste products, supporting sustained muscle activity during exercise.

An abrasion is a superficial injury caused by friction or scraping. In the image, the skin appears scraped with a raw, reddened surface, which is typical of an abrasion.

75. What best describes the visible injury on the person's elbow in the image?



- (a) Abrasion (scrape)
- (b) Laceration (cut)
- (c) Contusion (bruise)
- (d) Puncture wound

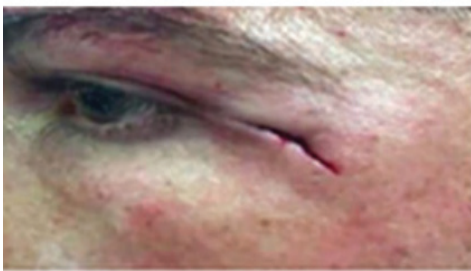
Ans :

OD 2016

- (c) Contusion (bruise)

A contusion (bruise) typically appears as a discolored area on the skin caused by bleeding under the surface. Unlike abrasions or lacerations, the skin is usually not broken.

76. What best describes the visible injury on the person's face in the image?



- (a) Abrasion (scrape)
- (b) Contusion (bruise)
- (c) Laceration (tear/cut)
- (d) Puncture wound

Ans :

FOREIGN 2018

- (c) Laceration (tear/cut)

A laceration is a tear or jagged cut in the skin, often caused by blunt or sharp trauma. Unlike abrasions or puncture wounds, a laceration typically has an irregular shape and may have deeper tissue involvement.

77. What type of wound is shown in the image?



- (a) Laceration
- (b) Abrasion
- (c) Incision
- (d) Contusion

Ans :

SQP 2020

- (c) Incision

An incision is typically a clean cut through the skin made by a sharp instrument, resulting in straight or nearly straight wound edges.

NODIA

TWO MARKS QUESTIONS

78. What do you mean by 'Cardiac Output'?

Ans :

2018, Delhi 2016

Cardiac output, which is expressed in liters per minute, represents the volume of blood the heart pumps in one minute. Consequently, cardiac output can be enhanced by an increase in stroke volume, heart rate, or a combination of both. Regular exercise plays a significant role in elevating the heart's cardiac output. For instance, players who engage in consistent exercise are observed to have a resting cardiac output ranging between 25-35 liters per minute, in contrast to untrained individuals who exhibit a resting cardiac output of only 14-20 liters per minute.

79. Explain the term hypertrophy of muscles.

Ans :

Delhi 2017, Delhi 2015

Muscle hypertrophy is the process whereby skeletal muscles increase in size due to the enlargement of their individual cells. Consistent exercise can result in muscle size increases of up to 60%. Two main factors contribute to this hypertrophy: sarcoplasmic hypertrophy, which emphasizes an increase in muscle glycogen storage, and myofibrillar hypertrophy, which centers on an enlargement of the myofibrils within the muscle fibers.

80. What do you know about the term 'cardiac output'?

Ans :

COMP 2018

Cardiac output is defined as the total volume of blood the heart pumps in one minute. It is calculated by multiplying the heart rate by the stroke volume, meaning that cardiac output represents the amount of blood circulated per minute. Regular exercise plays a crucial role in enhancing the heart's cardiac output. For example, players who exercise consistently exhibit a resting cardiac output ranging from 25 to 35 liters per minute, while untrained individuals typically have a resting cardiac output of only 14 to 20 liters per minute.

81. Elucidate any four types of fractures.

Ans :

2023

1. Green Stick Fracture: An incomplete fracture common in children, where the bone bends and cracks without completely breaking due to its flexibility.
2. Comminuted Fracture: A severe fracture where the bone shatters into several fragments, typically resulting from high-impact trauma, requiring surgical intervention.
3. Transverse Fracture: A clean, horizontal break across the bone caused by a direct force, leading to a straight-line crack.
4. Oblique Fracture: A diagonal break across the bone caused by twisting forces, which may complicate alignment during healing.

82. Point out physiological factor for strength.

Ans :

2023-24

Different sports demand varying levels of strength, necessitating a specific blend of slow-twitch and fast-twitch fibers. In sports that require sudden bursts of energy, a higher proportion of fast-twitch fibers is essential. Additionally, adaptations include:

1. Muscle hypertrophy
2. Enhanced strength of ligaments and tendons
3. An increase in both the size and number of mitochondria
4. Improved blood supply

83. Explain any three physiological factors determining strength.

Ans :

2022-23

The strength component of physical fitness

encompasses various subtypes, such as maximum strength, explosive strength, strength endurance, and others, each demanding different exercises, intensities, and durations that influence physiological responses. In sports like weightlifting, jumping, sprinting, or those emphasizing power, agility, and strength—where rapid force production and quick fatigue are common—a higher proportion of fast-twitch fibers is crucial. Energy for these activities is primarily generated by the ATP-CP or anaerobic system. Additionally, stroke volume, the blood volume pumped by the left ventricle during systole, is a critical cardiovascular parameter.

84. Define fracture and explain any four types of fracture.

Ans :

2023-24

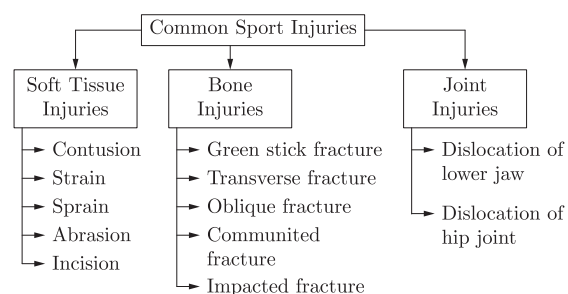
A fracture refers to a break in a bone, often resulting from a direct impact like a fall or a severe tackle. In the context of a stress fracture, consider the following options:

1. Greenstick
2. Comminuted
3. Transverse
4. Oblique
5. Impacted

85. Create a flowchart to explain classification of sports injuries.

Ans :

Term-II, 2021-22



86. What are the key physiological factors that determine the components of physical fitness?

Ans :

SPQ 2020

1. Oxygen Uptake ($\text{VO}_2 \text{ max}$): Reflects the maximum rate of oxygen consumption and is a major determinant of aerobic endurance.
2. Muscle Strength and Endurance: Determined by muscle fiber composition, neural activation, and metabolic adaptations.
3. Flexibility: Influenced by muscle-tendon elasticity and joint range of motion.

4. Body Composition: The ratio of lean muscle mass to fat mass, which affects energy expenditure and performance.

87. What are some common physiological changes due to aging, and how might they affect athletic performance?

Ans :

COMP 2017

1. Muscle Mass Loss (Sarcopenia): Aging leads to a decline in muscle mass and strength, affecting power and endurance.
2. Reduced Cardiovascular Efficiency: Lower maximum heart rate and decreased VO_2 max can limit aerobic performance.
3. Flexibility Decline: Aging is often accompanied by reduced joint mobility and increased stiffness, impacting the range of motion.
4. Metabolic Slowdown: A decrease in basal metabolic rate may affect energy balance and recovery.

88. Classify common sports injuries by differentiating soft tissue injuries from bone and joint injuries.

Ans :

DELHI 2009

1. Soft Tissue Injuries:
 - i. Abrasion: A superficial wound caused by friction.
 - ii. Contusion: A bruise resulting from blunt force trauma.
 - iii. Laceration: A tear or cut in the tissue, often irregular in shape.
 - iv. Incision: A clean, straight cut usually caused by a sharp object.
 - v. Sprain: Injury to ligaments due to overstretching.
 - vi. Strain: Injury to muscles or tendons from overstretching or overuse.
2. Bone and Joint Injuries:
 - i. Dislocation: Displacement of a bone from its joint socket.
 - ii. Green Stick: Incomplete fracture commonly seen in children.
 - iii. Comminuted: Bone breaks into multiple fragments.
 - iv. Transverse: A horizontal fracture line.
 - v. Oblique: A diagonal fracture line.
 - vi. Impacted: Bone fragments are driven into each other.

89. Identify and explain the primary physiological factors that determine aerobic endurance in sports.

Ans :

OD 2001

1. VO_2 max: The maximal oxygen uptake indicates the body's ability to use oxygen during intense exercise.
2. Cardiac Output: The amount of blood the heart pumps per minute, influenced by stroke volume and heart rate.
3. Capillary Density: Higher capillary density in muscles improves oxygen and nutrient delivery.

90. Discuss the metabolic and structural adaptations of the muscular system in response to regular exercise.

Ans :

FOREIGN 2004

1. Metabolic Adaptations : Increased mitochondrial density, enhanced oxidative enzyme activity, and improved glycogen storage lead to more efficient energy production.
2. Structural Adaptations : Muscle hypertrophy, fiber-type shifts (e.g., an increase in type I fibers with endurance training), and improved neuromuscular coordination enhance strength and endurance.

91. What changes occur in the cardiovascular system as a result of regular exercise, and how do they benefit athletes?

Ans :

SQP 2007

1. Increased Stroke Volume: The heart pumps more blood with each beat, improving oxygen delivery.
2. Reduced Resting Heart Rate: An indicator of a more efficient heart function, reducing overall cardiac strain.
3. Enhanced Oxygen Extraction: Increased capillary density and mitochondrial efficiency allow muscles to extract oxygen more effectively.

92. How do physiological changes due to aging affect physical performance, and what strategies can be used to mitigate these effects?

Ans :

COMP 2003

1. Effects of Aging: Declines in muscle mass, flexibility, and cardiovascular function, along with slower metabolic rates, can reduce performance levels.
2. Mitigation Strategies: Incorporating strength training, flexibility exercises, and aerobic conditioning can help maintain function.

Ans :

FOREIGN 2004

(a) Impacted

An impacted fracture results when the bone is crushed and compressed under high force, driving fragments into each other. This injury complicates proper alignment and healing and is commonly seen in severe trauma, requiring careful management or surgical realignment for recovery in sports.

52. Which physiological factor is a composite measure of overall fitness?

- (a) Flexibility only
- (b) Muscle strength only
- (c) All of the above
- (d) Basal Metabolic Rate

Ans :

SQP 2006

(c) All of the above

Overall physical fitness is a composite measure determined by muscle strength, cardiovascular endurance, flexibility, and additional factors such as balance and body composition. These diverse physiological components collectively contribute to an individual's ability to perform optimally in various athletic and daily activities universally.

53. Which system is primarily responsible for delivering oxygen during exercise?

- (a) Nervous
- (b) Digestive
- (c) Muscular
- (d) Cardiovascular

Ans :

COMP 2011

(d) Cardiovascular

The cardiovascular system is primarily responsible for delivering oxygen during exercise by pumping blood through vessels to active muscles. This process supports energy production and endurance by ensuring that muscles receive the necessary oxygen and nutrients required for sustained physical activity.

54. Which effect is NOT typically associated with regular exercise?

- (a) Increased VO_2 max
- (b) Enhanced muscle strength
- (c) Decreased insulin sensitivity
- (d) Improved flexibility

Ans :

DELHI 2016

(c) Decreased insulin sensitivity

Regular exercise increases VO_2 max, enhances

muscle strength, and improves flexibility while also improving insulin sensitivity. In contrast, decreased insulin sensitivity is not expected; exercise facilitates better glucose uptake and metabolic efficiency, thereby reducing the risk of metabolic disorders.

55. Which soft tissue injury is classified as a cut with smooth, even edges?

- (a) Abrasion
- (b) Laceration
- (c) Incision
- (d) Contusion

Ans :

OD 2002

(c) Incision

An incision is classified as a soft tissue injury involving a clean cut with smooth, even edges, typically caused by a sharp instrument. This type of injury generally requires suturing and careful wound care to minimize scarring and promote proper healing safely.

56. Which injury involves damage to ligaments, causing joint instability?

- (a) Sprain
- (b) Strain
- (c) Abrasion
- (d) Contusion

Ans :

FOREIGN 2013

(a) Sprain

A sprain involves damage to ligaments, which connect bones in a joint, leading to joint instability, pain, and swelling. It commonly occurs from twists or falls and requires rest, rehabilitation, and sometimes immobilization to restore joint function and stability effectively.

57. Which injury involves overstretching that causes damage to muscles or tendons?

- (a) Strain
- (b) Sprain
- (c) Abrasion
- (d) Contusion

Ans :

SQP 2020

(a) Strain

A strain involves damage to muscles or tendons caused by overstretching or overexertion. This injury results in microscopic tears, pain, and swelling, and it necessitates proper rest, ice application, and rehabilitation to ensure effective recovery and restoration of function adequately.

2. Enhancements with Training: Increased stroke volume, reduced resting heart rate, and improved lung function collectively lead to enhanced endurance, faster recovery, and improved overall athletic performance.

100. Identify the key physiological changes due to aging and discuss how these changes should influence exercise programming for older individuals.

Ans : FOREIGN 2013

1. Key Changes: Loss of muscle mass, decreased cardiovascular capacity, reduced flexibility, and slower metabolism.
2. Exercise Programming: Programs should emphasize low-impact aerobic activities, strength training with gradual progression, flexibility exercises, and proper recovery protocols to maintain functionality and minimize injury risks in older athletes.

THREE MARKS QUESTIONS

101. Maintaining physical activities for a longer period brings desirous changes in circulatory system. Justify your answer by highlighting three benefits of exercise.

Ans : Delhi 2015

Regular exercise benefits the circulatory system through several key improvements:

1. Enhanced Cardiovascular Endurance: Regular training improves the efficiency of the heart, lungs and blood vessels, allowing them to deliver more oxygen to the muscles.
2. Reduced Resting Heart Rate: Consistent exercise over an extended period leads to a lower resting heart rate. For instance, after about 10 weeks of training, the resting heart rate can decrease from 72 beats per minute to 60 beats per minute. With increased heart efficiency, fewer beats are needed to pump adequate blood, with elite athletes often exhibiting resting heart rates between 30-40 beats per minute.
3. Increased Tidal Air Capacity: Tidal air capacity, the lung volume representing the normal amount of air displaced during relaxed breathing, typically averages around 500 mL in healthy young adults. Long-term

exercise can increase this tidal volume up to approximately 1000 mL, enhancing overall respiratory efficiency.

102. Suggest any two Isometric exercises for shoulder region.

Ans : Delhi 2015

Isometric exercises for the shoulder region:

1. Stand a few inches from a wall, extend your arms fully, and press your hands against the wall as if pushing it away. Maintain this resistance for 12–14 seconds, and repeat for two additional sets.
2. Side Dumbbell Isometric Holds: Begin with your feet shoulder-width apart while holding a dumbbell in each hand. Internally rotate your shoulders so the side deltoids are engaged, then raise the dumbbells until you feel pressure on these muscles. Hold this contraction for 20–30 seconds.

103. Write a key point on cardio respiratory factors determining fitness.

Ans : 2023-24

1. Cardiovascular System : The cardiovascular system comprises three main components: the heart, blood vessels, and blood. Its primary role is to supply oxygen and essential nutrients to tissues, eliminate carbon dioxide and metabolic wastes, transport hormones and other vital molecules, assist in thermoregulation and fluid balance and ultimately support immune function.
2. Respiratory System : The respiratory system includes critical structures such as the nose, nasal cavity, pharynx, larynx, trachea, bronchi, and lungs, with the oral cavity serving as an alternate air passage. Its essential functions involve delivering air to the lungs, facilitating the exchange of oxygen and carbon dioxide between the air and blood, and maintaining proper blood pH levels.

104. Explain any two types of soft tissue injuries with the help of examples.

Ans : 2022-23

1. Abrasion : Abrasion injuries typically result from friction when the skin moves against a rough surface, leading to a scraping or rubbing off of the superficial layers of the epidermis.

- 112.** (a) How does regular exercise contribute to improved physiological efficiency in athletes?
- (b) Discuss how understanding these physiological adaptations can help in injury prevention and rehabilitation.

Ans :

FOREIGN 2018

- (a) **Physiological Efficiency :** Regular exercise leads to improved muscular strength, enhanced cardiovascular capacity, increased flexibility, and better body composition. These adaptations enable athletes to perform more efficiently by maximizing energy use, reducing fatigue, and improving overall endurance.
- (b) **Injury Prevention and Rehabilitation :** Understanding these adaptations allows coaches and medical professionals to design training programs that progressively enhance fitness without overloading the body. This approach minimizes the risk of injuries by ensuring muscles, joints, and connective tissues are adequately conditioned. Additionally, knowledge of these adaptations aids in developing targeted rehabilitation protocols that restore function and prevent re-injury.

- 113.** Discuss the physiological changes that occur in the muscular system as a result of endurance training versus strength training.

Ans :

SQP 2017

1. **Endurance Training:**
 - i. **Adaptations:** Increased mitochondrial density, enhanced capillary supply, and a shift toward more efficient aerobic metabolism.
 - ii. **Result:** Improved stamina, reduced fatigue, and greater resistance to muscle fatigue during prolonged activities.
2. **Strength Training:**
 - i. **Adaptations:** Muscle fiber hypertrophy (especially in type II fibers), increased neuromuscular coordination, and higher levels of muscle protein synthesis.
 - ii. **Result:** Greater muscle strength, power, and improved performance in high-intensity, short-duration activities.

Both training modalities enhance overall muscular performance but target different aspects of muscle function.

- 114.** Explain how exercise-induced adaptations in the cardiorespiratory system improve athletic performance. What are the key indicators of such adaptations?

Ans :

COMP 2009

Exercise leads to:

1. **Cardiac Adaptations:** Increased stroke volume and lower resting heart rate, indicating improved cardiac efficiency.
2. **Pulmonary Adaptations:** Enhanced lung ventilation and improved gas exchange, leading to more effective oxygen uptake.
3. **Vascular Adaptations:** Greater capillary density and improved blood flow, which facilitate the efficient delivery of oxygen and nutrients to muscles.
4. **Key indicators** include a reduced resting heart rate, faster heart rate recovery after exercise, increased maximal oxygen uptake ($\text{VO}_2 \text{ max}$), and enhanced endurance during prolonged activities.

- 115.** Describe the concept of physiological changes due to aging. How do these changes impact physical performance, and what strategies can be used to mitigate them?

Ans :

DELHI 2001

1. **Physiological changes due to aging include:**
 - i. **Reduced Muscle Mass and Strength:** Sarcopenia leads to diminished power and endurance.
 - ii. **Decreased Cardiovascular Function:** Lower maximum heart rate and reduced $\text{VO}_2 \text{ max}$ affect aerobic performance.
 - iii. **Reduced Flexibility and Joint Mobility:** Changes in connective tissues contribute to stiffness and a higher risk of injuries.
2. **Impact on Performance :** These changes result in slower reaction times, decreased endurance, and increased susceptibility to injuries.
3. **Mitigation Strategies:**
 - i. **Regular Exercise:** Combining strength, aerobic, and flexibility training helps counteract age-related declines.
 - ii. **Proper Nutrition:** A balanced diet with adequate protein and micronutrients supports muscle maintenance and overall health.
 - iii. **Recovery and Rest:** Sufficient recovery time is essential to prevent overuse injuries and promote long-term function.

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movement efficiency, and recovery are optimized.

- 108.** Describe the effects of exercise on the muscular system. What adaptations occur in response to regular training?

Ans : SQP 2019

Regular exercise leads to several adaptations in the muscular system:

1. Hypertrophy: Increase in muscle fiber size, which enhances strength and power.
2. Increased Capillarization: Growth of new capillaries within muscles improves oxygen and nutrient delivery.
3. Enhanced Mitochondrial Density: Greater numbers of mitochondria boost aerobic metabolism and endurance.
4. Improved Neuromuscular Coordination: Better synchronization of muscle fibers, resulting in more efficient and effective movements.

These adaptations collectively improve an athlete's performance by increasing strength, endurance, and recovery efficiency.

- 109.** Explain how exercise affects the cardiorespiratory system. What are the key changes that occur with consistent training?

Ans : COMP 2014

Exercise has a profound impact on the cardiorespiratory system:

1. Increased Cardiac Output: The heart pumps more blood per minute due to higher stroke volume, providing improved oxygen delivery to tissues.
2. Enhanced Lung Capacity: Regular exercise increases the efficiency of the lungs, leading to improved oxygen uptake and carbon dioxide expulsion.
3. Improved Blood Vessel Function: Increased elasticity and dilation of blood vessels lower blood pressure and enhance blood flow.
4. Better Oxygen Utilization: Muscular adaptations allow more efficient extraction and use of oxygen from the blood.

These changes lead to enhanced endurance, reduced fatigue, and overall improved athletic performance.

- 110.** (a) Define flexibility and explain its importance in sports performance.
- (b) Describe how exercise influences flexibility and what training methods can improve it.

Ans :

DELHI 2016

- (a) Definition and Importance : Flexibility is the range of motion available at a joint. It is vital for sports performance as it allows for smooth, coordinated movements and helps prevent injuries by reducing muscle stiffness.
- (b) Exercise Influence and Training Methods:
- i. Influence: Regular stretching and mobility exercises can increase flexibility by lengthening muscle fibers and improving joint lubrication.
 - ii. Training Methods: Techniques such as static stretching, dynamic stretching, and proprioceptive neuromuscular facilitation (PNF) are effective in enhancing flexibility.

By incorporating these methods, athletes can improve movement efficiency and reduce the risk of strains and sprains.

- 111.** Outline the classification of soft tissue and bone/joint injuries in sports. Provide examples for each category.

Ans :

OD 2020

1. Soft Tissue Injuries :
 - i. Abrasion: A superficial injury caused by scraping the skin.
 - ii. Contusion: A bruise resulting from a direct blow that damages capillaries.
 - iii. Laceration: A tear or deep cut in the tissue, often irregular in shape.
 - iv. Incision: A clean, straight cut typically made by a sharp object.
 - v. Sprain: Injury to ligaments caused by overstretching or tearing.
 - vi. Strain: Injury to muscles or tendons from overexertion or overstretching.
2. Bone & Joint Injuries:
 - i. Dislocation: The displacement of a bone from its joint socket.
 - ii. Fractures:

Green Stick: Incomplete fracture, common in children, where the bone bends and cracks.

Comminuted: The bone is broken into several pieces.

Transverse: A horizontal break across the bone.

Oblique: A diagonal fracture line.

Impacted: The bone fragments are driven into each other.

4. **Flexibility** : Flexibility is the ability of the muscles and joints to move through their full range of motion. Greater flexibility allows muscles to operate more rapidly and efficiently, which is essential for executing explosive movements. It also helps in reducing internal resistance during movement, thereby lowering the risk of injury.
5. **Biochemical Reserves and Metabolic Power** : For muscles to sustain high-speed contractions continuously, they require substantial energy, which is rapidly consumed during activity. Adequate stores of adenosine triphosphate (ATP) and creatine phosphate (CP) are essential to fuel these processes. When these energy reserves are depleted, the speed of muscle contraction declines, resulting in reduced overall speed. Training can increase the storage capacity of ATP and CP. Moreover, the rate at which ATP releases energy depends on the athlete's metabolic rate. Once glucose stores are exhausted, the body converts glycogen into glucose via enzymatic action, which is particularly important for endurance sports. This underscores the importance of metabolic power and biochemical energy reserves in maintaining high-speed performance.

136. Discuss in detail 2 long term and 2 short term effects of exercise on cardio respiratory system.

Ans :

Term-II, 2021-22

1. **Short-Term Effects:**

- (i) **Increased Heart Rate** : A typical human resting heart rate is around 72 beats per minute, though elite athletes may exhibit a resting rate close to 40 bpm. Before significant activity, the heart rate elevates in what is known as an “anticipatory response.” As exercise commences and intensity increases, the heart rate rises further.
- (ii) **Increased Stroke Volume** : Stroke volume refers to the amount of blood the left ventricle pumps out with each contraction. For a healthy adult male, the normal stroke volume is approximately 70 ml/beat. In elite athletes, this value can reach up to 100 ml/beat, which helps explain their low resting heart rate—due to a roughly 40% larger stroke volume. During intense exercise, the stroke volume can even double.

2. **Long-Term Effects:**

- (i) **Increase in Heart Size** : With sustained exercise over time, both the strength and size of the heart increase. The left ventricle, in particular, adapts significantly; the heart walls thicken, and the overall muscle strength of the heart is enhanced, improving its efficiency.
- (ii) **Decrease in Resting Heart Rate** : Regular exercise over extended periods leads to a reduction in resting heart rate. For instance, after 10 weeks of training, resting heart rates can drop from about 72 bpm to 60 bpm. As the heart becomes more efficient, it pumps sufficient blood at rest with fewer beats, with elite athletes often maintaining rates between 30 and 40 bpm.

137. What is the effect of exercise on cardio respiratory system and muscular system?

Ans :

OD 2020

1. **Effects of Exercise on the Cardiovascular System:**

- (i) **Elevated Heart Rate** : Typically, a human's resting heart rate is around 72 beats per minute, although elite athletes often maintain a resting rate near 40. Before engaging in significant activity, the heart rate increases—a phenomenon known as the “anticipatory response.” As exercise begins and its intensity ramps up, the heart rate further accelerates.
- (ii) **Enhanced Stroke Volume** : Stroke volume refers to the quantity of blood ejected by the left ventricle with each contraction. For a healthy adult male, the standard stroke volume is approximately 70 ml per beat. In elite athletes, this figure can be as high as 100 ml per beat, explaining their ability to sustain a low resting heart rate due to a roughly 40% larger stroke volume. During periods of intense exercise, stroke volume may even double.

2. **Effects of Exercise on Muscles:**

- (i) **Elevated Heart Rate** : The resting heart rate in most humans is about 72 beats per minute, though elite sports persons might exhibit a resting heart rate close to 40 beats per minute. An anticipatory response is observed when the heart rate increases before engaging in a significant activity. As the individual begins

- 116.** (a) Define sprain and strain, and differentiate between them in terms of tissue involvement and mechanism of injury.
- (b) What are the standard first-aid and treatment approaches for these injuries?

Ans :

OD 2004

- (a) Definitions and Differences :
- Sprain: An injury to ligaments caused by overstretching or tearing, typically resulting from a sudden twist or impact.
 - Strain: An injury to muscles or tendons due to overexertion or excessive stretching.
 - The key difference lies in the tissue affected: ligaments for sprains and muscles/tendons for strains.
- (b) First-Aid and Treatment:
- Initial Management (RICE): Rest, Ice, Compression, and Elevation are recommended for both injuries to reduce swelling and pain.
 - Rehabilitation: Involves gradual stretching, strengthening exercises, and physical therapy to restore function.
 - Medical Intervention: Severe injuries may require immobilization or, in extreme cases, surgical repair.
- These approaches aim to minimize tissue damage, facilitate healing, and restore normal function.

- 117.** Explain the classification of fractures common in sports injuries. How does each type of fracture affect the management and rehabilitation process?

Ans :

FOREIGN 2007

Common sports-related fractures include:

- Green Stick Fractures: Incomplete fractures typically seen in children; the bone bends and cracks without breaking completely.
- Comminuted Fractures: The bone is broken into several pieces, usually requiring surgical intervention for proper alignment and stabilization.
- Transverse Fractures: Horizontal breaks that generally allow for straightforward immobilization and healing.
- Oblique Fractures: Diagonally oriented fractures, which may require careful alignment and stabilization.
- Impacted Fractures: Bone fragments are driven into each other, often necessitating

realignment.

Each type influences treatment decisions, the duration of immobilization, and the rehabilitation process to ensure optimal recovery and return to sport.

- 118.** (a) How do the effects of exercise on the muscular and cardiorespiratory systems complement each other in enhancing overall physical fitness?
- (b) In what ways can a comprehensive understanding of these systems inform training and injury prevention strategies?

Ans :

SQP 2003

- (a) Complementary Effects:
- Muscular System: Exercise enhances muscle strength, endurance, and neuromuscular coordination, which are essential for movement and force generation.
 - Cardiorespiratory System: Improvements in cardiovascular endurance ensure efficient oxygen delivery and energy production during activity.
- (b) Informing Training and Prevention:
- Training Programs: A comprehensive understanding allows for the design of balanced training regimens that target both strength and endurance, reducing the risk of overtraining one system while neglecting the other.
 - Injury Prevention: By monitoring adaptations and fatigue in both systems, coaches can adjust training loads, incorporate adequate rest, and implement targeted conditioning to prevent injuries.

- 119.** Identify and explain the key components of physical fitness that are determined by physiological factors. How do these components interrelate to influence overall athletic performance?

Ans :

COMP 2008

Key components include:

- Muscular Strength & Endurance: Vital for force production and sustaining activities over time.
- Cardiorespiratory Endurance: Ensures efficient oxygen delivery and energy production during prolonged exercise.
- Flexibility: Allows for a full range of motion, reducing injury risk and improving movement efficiency.

heart muscle and increases its size, a condition known as cardiac hypertrophy. This makes the heart a more efficient pump.

2. **Decrease in Resting Heart Rate:** As the heart becomes stronger, its stroke volume (the amount of blood pumped per beat) increases. This means the heart needs to beat fewer times per minute to supply the body's needs at rest, resulting in a lower resting heart rate.
3. **Increased Capillaries Network:** To meet the body's increased demand for oxygen during exercise, the network of capillaries in the muscles becomes denser. This allows for more efficient transport of oxygen and nutrients to the muscle tissues, improving their ability to perform intense work.

129. What is “cardiac output”? How does regular exercise influence stroke volume and cardiac output in the long term?

Ans :

COMP 2014

Cardiac output is the total amount of blood pumped out by each ventricle of the heart in one minute. It is the product of heart rate (beats per minute) and stroke volume (blood pumped per beat). While a resting cardiac output is approximately 5.0 L/min, it can increase to 40 L/min or more in elite endurance athletes during maximal exercise.

Regular, long-term exercise leads to an increase in the size and strength of the heart muscle (cardiac hypertrophy). This stronger heart can pump more blood with each beat, leading to a significant increase in stroke volume. As a result of the increased stroke volume, the maximal cardiac output also increases, allowing the body to deliver more oxygenated blood to the working muscles, thereby enhancing endurance performance.

130. Describe the physiological changes that occur in bone mass and muscular strength due to the ageing process.

Ans :

DELHI 2018

Ageing leads to a progressive degeneration of the musculoskeletal system.

1. **Muscular Strength:** Peak strength is typically attained between ages 20 and 40. After this, strength declines, with muscle mass reducing by 40-50% between ages 25 and 80. This reduction is primarily caused by muscle fiber atrophy (shrinking) and an actual loss of motor units.

2. **Bone Mass:** Bone mass, the amount of minerals in the bone, also decreases with age. This process can lead to osteoporosis, particularly in postmenopausal women, where the skeleton demineralizes and becomes porous and fragile. Bone mass can decrease by as much as 30-50% in individuals older than 60, significantly increasing the risk of fractures.

131. Differentiate between a sprain and a strain, explaining the type of tissue each injury affects and its common causes.

Ans :

OD 2016

While often confused, sprains and strains are distinct soft tissue injuries affecting different parts of the musculoskeletal system.

1. A sprain is an injury to a ligament, which is the fibrous tissue that connects bones within a joint. Sprains are typically caused by a violent overstretching or tearing of a ligament when a joint is forced to move beyond its normal range of motion, such as when twisting an ankle.
2. A strain is an injury to either a muscle or a tendon (which attaches muscle to bone). Strains are generally caused by overuse, excessive force, or overstretching of the muscle. This can happen suddenly (an acute strain) from lifting a heavy object or can develop over time (a chronic strain) from repetitive movements.

132. (a) What are the three main energy systems the body uses during exercise?

(b) Briefly explain which energy system is dominant in a 100 m sprint versus a marathon.

Ans :

SQP 2020

- (a) The three main energy systems that work in the body to produce ATP (energy) are:
 - i. **ATP-CP (Creatine Phosphate) System:** Provides immediate energy for very short, high-intensity activities.
 - ii. **Anaerobic System (Glycolysis):** Provides energy for activities lasting less than two minutes by breaking down glucose without oxygen.
 - iii. **Aerobic System:** Uses oxygen to provide energy for long-duration activities.
- (b) The dominant energy system depends on the intensity and duration of the activity. For a 100 m sprint, which is a very short, explosive

Ans :

COMP 2005

- (a) Examples and First-Aid Measures:
- Contusion: A bruise caused by blunt trauma.
 - First-Aid: Apply ice to reduce swelling and pain.
 - Sprain: An injury to ligaments from overstretching.
 - First-Aid: Follow the RICE protocol (Rest, Ice, Compression, Elevation) to manage pain and swelling.
- (b) Minimizing Long-Term Damage:
- Immediate intervention reduces inflammation and prevents further tissue damage.
 - Proper care ensures that the injury heals in the correct alignment, reducing the risk of chronic instability or recurrent injuries.
 - These measures are critical for a safe recovery and maintaining long-term joint and muscle health.

- 125.** (a) How do physiological adaptations from exercise help in reducing the risk of injuries in sports?
- (b) Explain how the classification of sports injuries assists in developing targeted rehabilitation programs.

Ans :

DELHI 2011

- (a) Reducing Injury Risk:
- Improved muscle strength and flexibility help stabilize joints and absorb impact.
 - Enhanced cardiovascular endurance contributes to better overall conditioning, reducing fatigue that can lead to poor technique and injury.
- (b) Targeted Rehabilitation:
- Injury classification (e.g., soft tissue versus bone injuries) allows clinicians to design specific rehabilitation protocols tailored to the injury's nature and severity.
 - This targeted approach ensures that therapy addresses the exact deficits and promotes safe, gradual recovery.
 - Understanding both the adaptations from exercise and injury classification is essential for developing effective injury prevention and rehabilitation strategies.

- 126.** Differentiate between slow-twitch (Type I) and fast-twitch (Type II) muscle fibers and explain their role in different types of sports.

Ans :

OD 2013

The key difference between muscle fiber types lies in how they produce energy and how quickly they fatigue.

- Slow-twitch (Type I) fibers contain a high number of capillaries, myoglobin, and mitochondria, which allows them to produce large amounts of energy slowly through aerobic processes. They are red in color and highly resistant to fatigue. Because they can sustain activity for a long duration, they are dominant in endurance athletes like marathon runners and long-distance swimmers.
- Fast-twitch (Type II) fibers are lighter in color and use anaerobic processes to produce small amounts of energy very quickly. They contract rapidly and with great force but also tire quickly. These fibers are essential for explosive, short-duration sports like sprinting, weightlifting, and jumping.

- 127.** Describe the short-term effects of exercise on the muscular system.

Ans :

FOREIGN 2015

During exercise, the muscular system undergoes several immediate, short-term changes to meet the increased demands of physical activity. There is an increased blood supply to the working muscles to deliver more oxygen and fuel. As muscles contract to produce energy, they also generate significant heat, leading to an increased muscle temperature. This rise in temperature and blood flow also results in increased muscle flexibility. If the demand for oxygen outstrips the supply, it can lead to the accumulation of lactate, causing temporary pain and soreness in the muscles. Finally, the stress of exercise can cause microscopic tears in the muscle fibers, which the body later repairs to build stronger muscles.

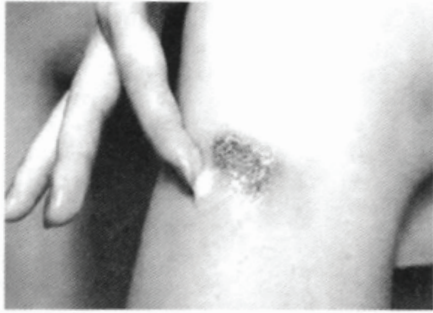
- 128.** Explain any three long-term effects of exercise on the cardiovascular system.

Ans :

SQP 2019

Regular, long-term exercise leads to significant positive adaptations in the cardiovascular system. Three key effects are:

- Increased Size and Strength of Heart:**
Continuous aerobic exercise strengthens the



Cause: Abrasions occur when exposed skin comes into contact with a coarse surface, which grinds or rubs away the top layers of the skin.

2. Contusion : A contusion is a type of hematoma, meaning it is a collection of blood that accumulates outside of a blood vessel.

Cause: A contusion develops when an impact is strong enough to crush the underlying muscle fibers and connective tissue without breaking the skin. This may happen due to collisions with another player, contact with equipment, or from a heavy fall.

- 105.** What is Laceration and how can it be managed?

Ans :

Term-II, 2021-22

Laceration : A laceration is an injury characterized by an irregular tear in the skin, often referred to as a cut. It occurs when an object impacts the skin, causing it to tear in a ragged manner. The severity of lacerations depends on factors such as the angle, force, depth, and type of object involved, and can range from superficial cuts to deep wounds that damage underlying tissues and result in significant bleeding. Symptoms include varying degrees of epidermal rupture, from minor slices to deep gashes, with bleeding and pain corresponding to the depth of the injury.

Treatment of Laceration:

1. Immediately stop the bleeding by applying compression or pressing the wound.
2. Thoroughly clean the affected area using water and soap.
3. Cover the wound with a medicinal cotton bandage or a band-aid to protect it.

- 106.** Contusion and dislocation are common sports injuries. Write in detail about the symptoms and management of these injuries.

Ans :

Delhi 2019

1. Symptoms of Contusion:

- (i) Swelling accompanied by pain
- (ii) The affected muscle exhibits reduced responsiveness
- (iii) Stiffness localized over the injured area
- (iv) Redness that may eventually turn blue or black

2. Management for Contusion:

- (i) Ensure the proper use of protective sports equipment
- (ii) If swelling is pronounced, administer anti-inflammatory medication
- (iii) Immediately apply cold compression
- (iv) Incorporate flexibility exercises during rehabilitation
- (v) After three days, switch from ice packs to heat application

3. Symptoms of Dislocation:

- (i) Intense pain localized over the joint
- (ii) Noticeable swelling of the joint
- (iii) Inability to move the joint
- (iv) Alteration in the shape of the joint

5. Management of Dislocation:

- (i) Support the affected joint with cushioning or padding
- (ii) Keep the injured person calm and composed
- (iii) Allow the individual to sit or lie in a comfortable position
- (iv) Apply an ice pack to the dislocated area
- (v) Seek immediate medical assistance

- 107.** Discuss the key physiological factors that determine components of physical fitness. How do these factors contribute to an athlete's performance?

Ans :

FOREIGN 2015

Physiological factors determining physical fitness include:

1. Muscular Strength and Endurance: The ability of muscles to exert force repeatedly, which is crucial for activities such as lifting, sprinting, and endurance sports.
2. Cardiovascular Endurance: The capacity of the heart and lungs to supply oxygen to working muscles during prolonged exercise.
3. Flexibility: The range of motion around a joint, which helps in injury prevention and efficient movement.
4. Body Composition: The ratio of fat to lean muscle mass, affecting overall performance and energy levels.

Together, these factors enable athletes to perform at high levels by ensuring that energy production,

event lasting around 10 seconds, the ATP-CP system is the dominant energy provider. In contrast, a marathon is a long-duration endurance event. Therefore, the aerobic system is the dominant provider of energy, as it can sustainably produce energy over a prolonged period using oxygen.

- 133.** (a) What are the short-term effects of exercise on the respiratory system?
- (b) Explain how long-term exercise increases the efficiency of respiratory muscles and lung volume.

Ans :

COMP 2004

- (a) During exercise, the respiratory system responds immediately to meet the body's increased demand for oxygen. The respiratory rate, or breathing rate, increases significantly, rising from a resting rate of 12-20 breaths per minute to as high as 40. The tidal volume, which is the amount of air inhaled and exhaled in a single breath, also increases to allow more oxygen intake. This results in a much higher rate of exchange of gases (oxygen and carbon dioxide) in the lungs to fuel the working muscles.
- (b) With regular long-term training, the respiratory system becomes more efficient. The respiratory muscles (like the diaphragm and intercostals) become stronger, allowing for fuller and more fluent inhalation and exhalation. This increased efficiency helps to increase the lung volume and vital capacity, in some cases up to 100% more than a normal individual. This means the lungs can take in more air, and the body becomes better at delivering oxygen to the muscles.

- 134.** (a) What is a fracture? Differentiate between a simple (closed) and a compound (open) fracture.
- (b) Describe the characteristics of a Greenstick and a Comminuted fracture.

Ans :

DELHI 2002

- (a) A fracture is defined as a break in the continuity of a bone. The severity can range from a mild crack to the bone shattering into many pieces. A simple (or closed) fracture is a break where the bone does not pierce the skin. In contrast, a compound (or open) fracture is more severe, as the broken bone end pierces through the skin, creating an open wound

and increasing the risk of infection.

- (b) A Greenstick fracture is an incomplete break that occurs in a young, soft bone, where the bone bends and cracks on one side but does not break all the way through. This type of fracture is most common in children. A Comminuted fracture is one where the bone is broken, splinted, or crushed into a number of pieces. This type of fracture is typically caused by severe trauma or violence, such as a high-impact collision.

NODIA

FIVE MARKS QUESTIONS

- 135.** Explain the physiological factors determining speed.

Ans :

AI 2017

Speed in an athlete is influenced by several factors:

1. **Mobility of the Nervous System :** The nervous system controls the contraction and relaxation of muscles. The frequency of these contractions is determined by the excitability of the nerves. Essentially, the mobility of the nervous system refers to how quickly motor nerves can be excited and then relax to cause muscle action. This factor is crucial in sports like sprinting and running. Although largely inherent, the mobility of the nervous system can be enhanced through targeted training and skill development.
2. **Muscle Composition :** Skeletal muscles are made up of three fiber types—Type I, Type IIA, and Type IIB. The overall speed of an athlete is greatly influenced by the ratio of these fibers. While this composition is primarily determined by genetics, proper training can significantly improve performance by optimizing the functionality of the existing muscle fibers.
3. **Explosive Strength :** Explosive strength is vital for quick, powerful movements such as a rapid punch in boxing, a jerk lift in weightlifting, or the burst of speed at the start of a sprint. This type of strength relies on several factors including muscle composition, muscle size, metabolic processes, and muscle coordination. While training can enhance most of these factors, the inherent muscle composition remains genetically fixed.

4. Body Composition: Influences speed, agility, and endurance by balancing fat and lean muscle mass.

These components are interrelated; for example, improved cardiovascular endurance supports muscle recovery, while better muscle strength enhances overall performance, creating a well-rounded athlete.

- 120.** Describe the effect of exercise on muscle physiology. What cellular and systemic changes occur with regular training?

Ans :

DELHI 2006

Regular exercise induces:

1. Cellular Changes:
 - i. Increased mitochondrial density improves aerobic capacity.
 - ii. Enhanced protein synthesis leading to muscle hypertrophy.
 - iii. Adaptations in muscle fiber composition favoring endurance (shift toward type I fibers) or power (increased type II fiber recruitment).
2. Systemic Changes:
 - i. Improved blood flow and capillarization in muscle tissues.
 - ii. Enhanced neuromuscular coordination for efficient movement.
 - iii. These adaptations contribute to increased strength, endurance, and overall performance.

- 121.** (a) Explain how aging affects the muscular and cardiorespiratory systems.
 (b) What interventions can be employed to mitigate these age-related changes?

Ans :

OD 2002

- (a) Effects of Aging:
- i. Muscular System: Loss of muscle mass (sarcopenia) and reduced strength.
 - ii. Cardiorespiratory System: Decreased maximal heart rate, lower VO_2 max, and reduced lung capacity.
- (b) Mitigation Strategies:
- i. Resistance Training: Helps maintain muscle mass and strength.
 - ii. Aerobic Exercise: Supports cardiovascular health and improves endurance.
 - iii. Flexibility and Balance Training: Reduces the risk of falls and maintains joint mobility.

These interventions help maintain function and quality of life in older adults.

- 122.** (a) How do the physiological adaptations from exercise help in preventing sports injuries?
 (b) In what ways can an understanding of injury classification inform effective rehabilitation strategies?

Ans :

FOREIGN 2010

- (a) Injury Prevention Through Adaptation :
- i. Enhanced muscle strength and flexibility reduce the likelihood of strains.
 - ii. Improved cardiovascular endurance supports quicker recovery and less fatigue, lowering injury risk.
- (b) Rehabilitation Strategies Informed by Injury Classification:
- i. Specific protocols can be developed for soft tissue injuries (e.g., RICE, gradual stretching) versus bone fractures (e.g., immobilization, weight-bearing progression).
 - ii. Accurate classification allows for targeted therapy that addresses the severity and specific nature of the injury, ensuring a safe and effective return to sport.
 - iii. This integrated understanding helps optimize both preventive measures and rehabilitation outcomes.

- 123.** What is Basal Metabolic Rate (BMR) and why is it essential in sports nutrition planning?

Ans :

SQP 2012

Basal Metabolic Rate (BMR) is the amount of energy expended by the body at rest to maintain essential physiological functions such as breathing and circulation.

Importance in Sports Nutrition:

1. Determines the minimum caloric requirement needed for basic bodily functions.
2. Serves as a baseline to which additional energy expenditure from training is added.
3. This ensures that athletes receive adequate nutrition to support both their daily activities and rigorous training demands.

- 124.** (a) Describe two common soft tissue injuries in sports and the immediate first-aid measures recommended for each.
 (b) How do these measures help in minimizing long-term damage?

exercising and the intensity of the exercise increases, the heart rate continues to rise.

- (ii) **Enhanced Stroke Volume** : Stroke volume is defined as the amount of blood pumped by the left ventricle of the heart with each contraction. For a healthy adult male, a normal stroke volume is around 70 ml per beat. In elite athletes, however, this volume can reach up to 100 ml per beat, which accounts for their ability to maintain a lower resting heart rate—since their stroke volume is approximately 40% greater. During vigorous exercise, the stroke volume may double.

138. What are the long term effects of regular exercise on the cardio-vascular system? Explain.

Ans :

FOREIGN2018

Long-term Effects of Exercise on the Cardiovascular System :

1. **Increase in Heart Size** : Consistent long-term exercise leads to an increase in the heart's strength and size, with the left ventricle showing the most pronounced adaptations. The heart walls thicken and the muscle becomes stronger. This increase in thickness is beneficial because the heart performs extra work only for a limited period (about an hour) during exercise, unlike the constant strain experienced in high blood pressure.
2. **Decrease in Resting Heart Rate** : Prolonged regular exercise results in a lower resting heart rate. Studies have shown that after approximately 10 weeks of training, the resting heart rate can drop from around 72 beats per minute to 60 beats per minute. As the heart becomes more efficient, it is able to pump sufficient blood at rest with fewer beats, with elite athletes often exhibiting resting rates between 30 and 40 beats per minute.
3. **Increase in Stroke Volume** : Stroke volume, which is the amount of blood pumped with each heartbeat, increases with sustained exercise. While the average resting stroke volume ranges from 50 to 70 ml, elite athletes can have resting stroke volumes between 90 and 110 ml, reflecting the heart's enhanced pumping capacity.
4. **Increase in Cardiac Output at Rest** : Cardiac output, defined as the total volume of blood pumped by the heart in one minute, also

increases as a result of regular exercise. Research shows that trained individuals have a resting cardiac output of approximately 25 to 35 liters per minute, compared to 14 to 20 liters per minute in untrained individuals.

5. **Increased Blood Vessels** : To meet the heightened energy demands of muscles during exercise, more blood needs to be delivered with essential nutrients and oxygen. Consequently, the number of capillaries increases, and existing capillaries widen, improving overall blood flow and making the blood supply more efficient and effective.
6. **Decreased Blood Pressure** : Long-term regular exercise leads to a reduction in blood pressure, with noticeable decreases in systolic blood pressure (up to 10 mm Hg), thereby diminishing the symptoms of hypertension and lowering the risk of heart attacks. However, individuals with hypertension should consult their physician before beginning any exercise program.

139. What do you mean by 'Oxygen-Intake' and 'Oxygen-Uptake'? Explain the effects of exercise on Respiratory system.

Ans :

Delhi 2017

1. **Oxygen Intake** : This refers to a person's lungs being able to absorb a substantial amount of oxygen from the atmosphere through breathing. Factors such as lung size, the number of active alveoli, the strength of respiratory muscles, and the size of the chest cavity all play a role. For well-trained athletes, oxygen intake is seldom a limiting factor.
2. **Oxygen Uptake (VO_2 max)** : Also known as maximal oxygen consumption, peak oxygen uptake, or maximal aerobic capacity, VO_2 max represents the highest rate at which oxygen is consumed during progressive exercise.
3. **Effects of Exercise on the Respiratory System**: During exercise, both the rate and depth of breathing increase, ensuring that more oxygen is available in the bloodstream for delivery to the muscles. This heightened ventilation also facilitates the efficient removal of carbon dioxide and other metabolic wastes produced by increased muscle activity. The breathing rate can be quantified by counting the number of breaths per minute, while the depth of breathing is measured using a spirometer.

- i. Increase in Tidal Air Capacity : Tidal volume (VT or TV) is the lung volume representing the normal amount of air moved during relaxed inhalation and exhalation. In a healthy young adult, tidal volume is approximately 500 mL. The lungs possess substantial inspiratory and expiratory reserves, and exercise increases tidal volume by reducing these reserves. In individuals with normal lung function, tidal volume can double to around 1000 mL.
- ii. Decrease in the Resting Rate of Respiration : While starting exercise typically causes the respiratory rate to rise, long-term exercise leads to a lower resting respiration rate due to an increase in tidal volume.
- iii. Strengthening of the Diaphragm : Regular exercise enhances the strength and flexibility of the diaphragm, improving its overall function.
- iv. Reduced Occurrence of a Second Wind : Well-trained athletes rarely experience a “second wind.” As the body adapts to prolonged exercise by becoming more efficient at using oxygen, reliance on anaerobic energy production decreases, reducing the sensation of needing extra oxygen during activities like distance racing.
- v. Activation of More Alveoli : An unhealthy lifestyle can render some alveoli inactive due to lower oxygen demand. However, during exercise, the lungs work harder to meet oxygen needs, thereby activating more alveoli. This increase in active alveoli helps supply greater oxygen to working muscles and tissues.
- vi. Increase in Lung Capacity : Exercising requires more oxygen than at rest, prompting the lungs to inhale more deeply and the heart to pump more blood. Regular aerobic exercise can improve lung capacity by up to 15%, even though the physical size of the lungs remains unchanged.
- vii. Increase in Vital Air Capacity : Normal adults have a vital capacity ranging between 3-5 liters, influenced by factors such as height, weight, sex, age, and ethnicity. A lower vital capacity is often associated with disabilities, obesity, or

chronic respiratory conditions. Exercise increases vital capacity because muscles need additional oxygen during strenuous activities, prompting the lungs to expand further and enhancing overall lung health.

- 140.** Describe any three physiological changes due to ageing.

Ans :

2024

Exercise offers innumerable benefits for older adults, including a healthier heart, stronger bones, and enhanced flexibility. Moreover, regular exercise boosts cognitive function; studies have shown that brain neurons—the specialized cells responsible for vital functions and thinking—actually increase after a few weeks of consistent physical activity. In essence, physical activity acts as medicine for seniors, delaying the ageing process. Its benefits in maintaining functional fitness in the aged population include:

1. Reducing the Loss of Muscle Mass : Muscle mass naturally decreases with age, and metabolism slows down over time. Regular exercise helps delay the loss of lean body mass, maintains a healthier metabolic rate, and minimizes the accumulation of body fat.
2. Maintaining Bone Density : Ageing tends to steadily reduce bone density, but consistent exercise can slow this loss and even enhance bone mineralization. With a doctor’s advice, especially for older women, supplementing with vitamin D and calcium can further support bone health.
3. Slowing Brain Ageing : Individuals who exercise regularly show better cognitive performance, suggesting that physical activity may help slow the ageing process of the brain and preserve mental functions.
4. Reducing the Risk of Age-Related Diseases : Engaging in sporting activities can prevent or delay various age-dependent diseases such as diabetes, cancer, stroke, heart disease, and osteoporosis. Regular exercise may also reduce wound-healing time by 25% and strengthen the body’s ability to fight infections, thus aiding recovery from illness or injury.
5. Improving Muscle Strength : Exercise increases the size of muscles, which in turn enhances muscle strength, contributing to better overall physical performance.
6. Enhancing Lung Capacity : Regular physical activity improves lung capacity by reducing the loss of elasticity in the lungs and

diaphragm. This, along with strengthening the chest muscles, leads to increased oxygen uptake and more efficient oxygen exchange.

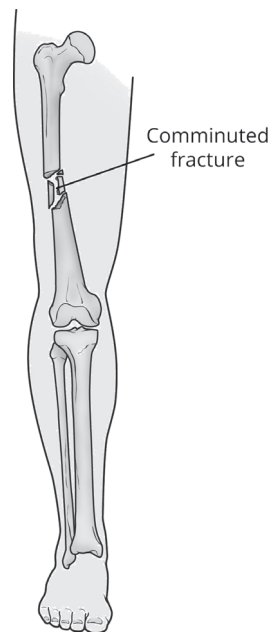
7. **Improving Flexibility :** Consistent exercise improves the elasticity of tendons, ligaments, and joint capsules, thereby reducing joint stiffness and enhancing overall flexibility.
8. **Boosting Balance and Coordination :** Falls are a leading cause of injury among the elderly. Regular exercise helps improve balance and coordination, reducing the likelihood of falls and associated injuries such as broken hips.
9. **Enhancing Quality of Life and Increasing Life Expectancy :** Recent research indicates that seniors who exercise not only improve their physical fitness but also gain psychological benefits. Exercise can alleviate symptoms of depression, improve mood, and boost mobility, thereby helping seniors maintain independence and enjoy a better quality of life.
10. **Reducing Stress and Tension :** Regular physical activity helps relax the mind and reduces both mental and physical strain. It also stimulates the production of endorphins—natural painkillers and mood enhancers—promoting happiness and further delaying the ageing process.

141. Draw diagram and explain the management of any 2 types of bone injury.

Ans :

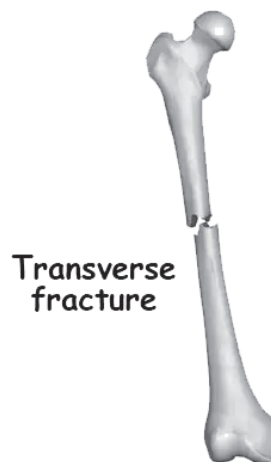
Term-II, 2021-22

1. **Greenstick :** A greenstick fracture occurs in a young, pliable bone where the bone bends rather than breaks completely.
 - i. **Causes:** These fractures most frequently result from a fall.
 - ii. **Prevention:** Encouraging regular exercise, ensuring a child's safety with appropriate protective gear, and providing sufficient dietary calcium can help prevent this type of fracture.
 - iii. **Treatment:** In children with torus fractures of the distal radius, using removable splints yields better outcomes than casting.
2. **Comminuted :** A comminuted fracture is one in which a bone is broken, splintered, or crushed into several pieces.



- i. **Causes:** Both direct and indirect trauma, or even violence, can lead to a comminuted fracture.
- ii. **Prevention:** Strong bones can be maintained by consuming a calcium-rich diet and engaging in regular exercise, which helps prevent this kind of fracture.
- iii. **Treatment:** Diagnosis is confirmed with an X-ray, and treatment typically requires an open reduction, where the bone fragments are realigned and stabilized using surgical nails, wires, or plates.

3. **Transverse :** A transverse fracture is characterized by a clean, straight break that runs directly across the bone.



- i. **Causes:** This type of fracture occurs when a substantial force is applied directly, or perpendicularly, to the bone.

I) muscle fibers. These fibers are red, rich in capillaries and myoglobin, and are highly resistant to fatigue, allowing them to contract for long durations. The dominant energy system for endurance activities is the aerobic system, which uses oxygen to produce large amounts of energy slowly, fueling activities like marathons, long-distance cycling, and swimming. Furthermore, an athlete's endurance capacity is linked to cardiorespiratory factors like maximal oxygen consumption (VO₂ Max) and the efficiency of the circulatory system in delivering oxygen to the working muscles.

146. What are soft tissue injuries? Describe in detail the characteristics, causes, and treatment for Contusion, Strain, and Sprain.

Ans :

COMP 2016

Soft tissue injuries are a classification of sports injuries that involve damage to the body's muscles, ligaments, and tendons. These are common in sports and can range from minor to severe, affecting an athlete's ability to perform. Three of the most common soft tissue injuries are contusions, strains, and sprains.

1. Contusion (Bruise):

- i. Characteristics: A contusion is a bruise caused by a direct blow that crushes underlying muscle fibers and connective tissue without breaking the skin. It results in a hematoma, which is a collection of blood outside of a blood vessel.
- ii. Causes: It is commonly caused by a collision with another player, hitting a piece of equipment, or a heavy fall.
- iii. Treatment: Treatment typically involves using non-steroidal anti-inflammatory drugs (NSAIDs) like Ibuprofen or other pain relief medications as prescribed by a doctor. The RICE protocol (Rest, Ice, Compression, Elevation) is also fundamental.

2. Strain:

- i. Characteristics: A strain is an injury to either a muscle or a tendon (which attaches muscle to bone). A strain can range from a simple overstretch of the tissue to a partial or even complete tear.
- ii. Causes: Strains can occur suddenly (acute) from activities like lifting heavy objects, running, or jumping, or they

can develop over time (chronic) from repetitive movements.

- iii. Treatment: A strain can be managed by applying ice packs and keeping the affected muscle in a stretched position. The RICE protocol (Rest, Ice, Compression, and Elevation) is the standard initial treatment.

3. Sprain:

- i. Characteristics: A sprain is the stretching or tearing of ligaments, the fibrous tissues that connect bones within a joint. The ankle is the most common location for a sprain.
- ii. Causes: A sprain occurs when a joint is severely stressed, causing the ligaments to overextend or tear. This often happens due to a sudden twist or fall.
- iii. Treatment: The initial treatment for a sprain is the RICE protocol (Rest, Ice, Compression, and Elevation) to manage swelling and pain.

147. Explain the various physiological changes that occur due to the ageing process in the human body. Your answer should cover changes in muscular strength, bone mass, and neural function.

Ans :

DELHI 2020

Ageing is an inevitable biological process characterized by the progressive degeneration of organ systems and tissues, which is influenced by both genetics and environmental factors. This process brings about several key physiological changes.

1. Changes in Muscular Strength : Men and women typically reach their peak strength levels between the ages of 20 and 40. After this period, strength begins to decline, slowly at first and then more rapidly after middle age. The primary cause for this reduction in strength is a significant loss of muscle mass, which can be as much as 40% to 50% between the ages of 25 and 80. This loss occurs due to the atrophy (shrinking) of muscle fibers and a decrease in the actual number of motor units that activate the muscles.
2. Changes in Bone Mass : With ageing, the skeleton tends to demineralize and become more porous, a condition known as osteoporosis. This loss of bone mass poses a major health problem, particularly among postmenopausal women. Bone mass

- ii. **Conditioning** : Especially when there is a change in climate, it is essential to condition the body, including a period of heat acclimatization over several days. As part of the pre-participation evaluation, athletes should undergo tests for cardio-respiratory fitness, flexibility, and muscle strength. Those identified as having potential injury risks due to weakness or tightness should follow an individualized exercise program.
- iii. **Not Overdoing It** : When starting a new exercise program, it is important not to overdo it. For those who have not exercised for an extended period, engaging in strenuous activity immediately can cause more harm than benefit. As fitness levels improve, the intensity of the activity can gradually be increased.
- iv. **Avoid Dehydration** : Staying well-hydrated is crucial when exercising. It is recommended to drink one glass of water every 20 minutes during exercise, in addition to the standard recommendation of six to eight glasses (approximately 1.2 liters) per day. In warm weather or during endurance sports, even more water should be consumed to prevent dehydration.
- v. **Use the Right Technique** : Employing the correct technique in any sport is key to reducing the risk of injuries. Proper technique can help prevent overuse injuries, such as tendonitis and stress fractures, by ensuring that the movements are performed safely and efficiently.

144. List any four changes happening in the muscular system due to exercising.

Ans :

Term-II, 2021-22

Changes in the Muscular System Due to Exercise:

1. **Changes in Muscle Size and Shape** : Regular exercise promotes the enlargement of muscle cells, which in turn alters the overall size and shape of the muscles.
2. **Enhanced Muscle Strength** : Individuals who exercise daily develop stronger muscles that work more efficiently. These muscles receive increased oxygen—essentially a form of nutritional support—that contributes to their enhanced strength.
3. **Improved Coordination** : Consistent exercise boosts coordination among muscle groups, enabling them to function in harmony. This

improved coordination helps prevent fatigue during prolonged activity; without it, effective muscle performance becomes challenging.

4. **Greater Oxygen Intake** : During exercise, muscles demand more work, leading to an increased consumption of oxygen. As a result, blood reaches the muscles more rapidly, ensuring they receive the oxygen needed for sustained activity.
5. **Increased Blood Supply** : Regular exercise enhances the delivery of vital chemical substances—such as glycogen, phosphocreatine, and potassium—to the muscles. These substances contribute to an increased speed of blood flow.
6. **Enhanced Blood Circulation** : At rest, blood typically completes a circuit through the body in about 21 seconds; however, during exercise, this circulation can accelerate to 15, 10, or even 8 seconds. This improvement is due to the heart muscles working faster to meet the body's heightened demands.

145. Elaborate on the physiological factors that determine the physical fitness components of strength and endurance. Your answer should discuss the role of muscle fiber composition and energy production systems for each component.

Ans :

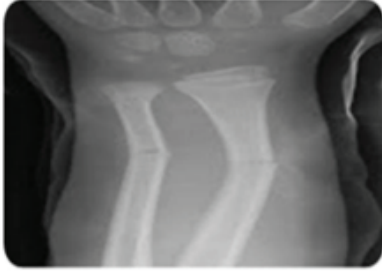
SQP 2013

The physical fitness components of strength and endurance are determined by a combination of key physiological factors, primarily muscle fiber composition and the body's energy production systems.

1. **Strength**, which is the ability to work against resistance, is largely determined by the proportion of fast-twitch (Type II) muscle fibers. These fibers contract quickly and with great force, making them essential for sports requiring sudden bursts of power like weightlifting, sprinting, and throwing events. The dominant energy system for such high-intensity, short-duration activities is the ATP-CP (Creatine Phosphate) system, which provides immediate energy for tasks lasting less than 10 seconds. The amount of force generated also depends on the number of motor units recruited and the nature of the neural stimulation sent to the muscles.
2. **Endurance**, the ability to sustain activity over a prolonged period, is determined by a different set of factors. It relies heavily on a high percentage of slow-twitch (Type

- (c) Immobilization combined with surgical intervention

154. In reference to the picture answer the following questions :



- (i) Which type of fracture is depicted in the image?
 (a) Greenstick
 (b) Comminuted
 (c) Impacted
 (d) Oblique

Ans :

- (a) Greenstick
 (ii) Which statement accurately describes a greenstick fracture?
 (a) The bone shatters into multiple fragments.
 (b) One fragment of bone is driven into another.
 (c) The bone bends and partially breaks.
 (d) The fracture line runs diagonally across the bone.

Ans :

- (c) The bone bends and partially breaks
 (iii) What is a common cause of a greenstick fracture?
 (a) High-impact collision at high speed
 (b) A twisting force on an already weakened bone
 (c) A fall where a child's bone bends instead of breaking fully
 (d) Repetitive stress over a long period

Ans :

- (c) A fall where a child's bone bends instead of breaking fully
 (iv) Which of the following is often recommended for treating a greenstick fracture in children?
 (a) Surgery with metal plates
 (b) Simple bandage only
 (c) Immobilization with a cast or splint
 (d) No treatment is necessary

Ans :

- (c) Immobilization with a cast or splint

155. In reference to the picture answer the following questions :



- (i) Which type of soft tissue injury is depicted in the image?
 (a) Laceration
 (b) Abrasion
 (c) Contusion
 (d) Incision

Ans :

- (b) Abrasion
 (ii) What is the first step in managing an abrasion?
 (a) Apply an ointment immediately
 (b) Clean the wound with mild soap and water
 (c) Cover the wound with a tight bandage
 (d) Rub the wound with alcohol

Ans :

- (b) Clean the wound with mild soap and water
 (iii) Which of the following is a common cause of an abrasion?
 (a) Deep puncture by a sharp object
 (b) Blunt force trauma that bruises underlying tissue
 (c) Friction or scraping against a rough surface
 (d) Bone fragment penetration through the skin

Ans :

- (c) Friction or scraping against a rough surface
 (iv) Which of these is recommended for treating an abrasion after cleaning it?
 (a) Leaving it completely uncovered at all times
 (b) Using a sterile dressing or bandage
 (c) Scrubbing vigorously to remove scabs
 (d) Applying tight pressure for several hours

can decrease by as much as 30% to 50% in individuals older than 60, which makes the bones fragile and significantly increases the risk of fractures.

3. **Changes in Neural Function :** The central nervous system also experiences age-related decline. There is a nearly 40% decline in the number of spinal cord axons and a 10% decline in nerve conduction velocity. These changes contribute to a reduction in overall neuromuscular performance, which can be seen in slower reaction and movement times. Ageing particularly affects the time required to detect a stimulus and process the information needed to produce a response, slowing down an individual's reflexes and coordination.

- 148.** (a) Differentiate between the short-term and long-term effects of exercise on the muscular system, providing examples for each.
- (b) Specifically explain the physiological processes behind muscle hypertrophy and the increase in lactate acid tolerance as long-term adaptations.

Ans :

OD 2014

- (a) The effects of exercise on the muscular system can be categorized into immediate responses and long-term adaptations.
- i. **Short-Term Effects** are the immediate changes that occur during and shortly after exercise. These include an increased blood supply to the muscles to deliver more oxygen, a rise in muscle temperature due to heat generated from contractions, and an accumulation of lactate if oxygen demand is not met. Another short-term effect is the creation of micro-tears in the muscle fibers due to the stress of the exercise.
 - ii. **Long-Term Effects** are the physiological adaptations that occur after months or years of regular, systematic exercise. These include an increase in the size of muscles (hypertrophy), increased strength of ligaments and tendons, an increase in the size and number of mitochondria for better energy production, and an increased storage of myoglobin and glycogen within the muscles.
- (b) Two key long-term adaptations are:
- i. **Muscle Hypertrophy:** This refers to the

increase in the thickness of muscle fibers, which results in an overall increase in muscle size. This process occurs because when exercise causes micro-tears in the muscle fibers, the body responds by repairing these fibers and making them larger and stronger to better handle future stress. This is the primary way that scientific and systematic exercise leads to visible muscle growth.

- ii. **Increase in Lactate Acid Tolerance:** Lactic acid accumulates in muscles during intense exercise when there is not enough oxygen, leading to pain and soreness. Through regular exercise, the body adapts in two ways. First, the circulatory system becomes more efficient at delivering oxygen to the muscles. Second, the muscles themselves become better prepared to work with lower levels of oxygen and develop a higher tolerance for the pain and soreness caused by lactate accumulation, allowing the athlete to perform at a high intensity for longer.

CASE BASED QUESTION

- 149.** Study the pictures given below :

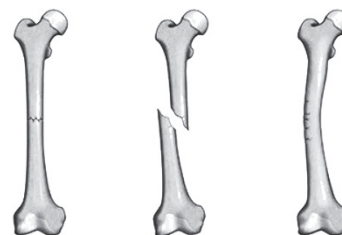


Image -1

Image -2

Image -3

Based on the above study and your knowledge, answer the following questions :

- (i) Which type of fracture you see in image-1?
- (ii) When a bone breaks diagonally as shown in image-2, it is known as _____.
- (iii) _____ fracture occurs when the broken ends of the bones are jammed together by the force of the injury.
- (iv) In which type of fracture bone is broken, splinted, or crushed into number of pieces?

Ans :

- (i) In image 1 it is transverse fracture, in which there is a straight break right across a bone.
- (ii) Oblique fracture is one in which the bone breaks diagonally.
- (iii) Impacted fracture occurs when the broken ends of the bones are jammed together by the force of the injury.
- (iv) A fracture in which a bone is broken, splinted, or crushed into number of pieces is Comminuted.

150. In reference to the picture answer the following questions :



- (i) Which types of injury is illustrated above?
 - (a) Soft tissue
 - (b) Hard tissue
 - (c) Joint injury
 - (d) Ligament injury

Ans :

- (b) t
- (ii) Recognise the type of fracture is illustrated above:
 - (a) Green Stick
 - (b) Comminuted
 - (c) Transverse
 - (d) Oblique

Ans :

- (c) Transverse
- (iii) In which of the fractures bone “breaks diagonally”?
 - (a) Green Stick
 - (b) Comminuted
 - (c) Transverse
 - (d) Oblique

Ans :

- (d) Oblique

151. In reference to the picture answer the following questions :



- (i) Which type of fracture is depicted in the image?
 - (a) Greenstick
 - (b) Comminuted
 - (c) Transverse
 - (d) Oblique

Ans :

- (d) Oblique
- (ii) What is a common cause of an oblique fracture?
 - (a) Twisting force applied to the bone
 - (b) Direct, perpendicular impact
 - (c) Bone weakening due to infection
 - (d) Low-impact collisions

Ans :

- (a) Twisting force applied to the bone
- (iii) Which of the following might be a recommended treatment for an oblique fracture?
 - (a) No treatment is necessary
 - (b) Simple bandaging
 - (c) Immobilization with a cast or surgical fixation
 - (d) Only massage therapy

Ans :

- (c) Immobilization with a cast or surgical fixation
- (iv) Which statement accurately describes an oblique fracture?
 - (a) The fracture line is horizontal
 - (b) The bone is shattered into multiple fragments
 - (c) The fracture line runs diagonally across the bone
 - (d) The bone bends but does not break fully

Ans :

(c) The fracture line runs diagonally across the bone

152. In reference to the picture answer the following questions :



- (i) Which type of fracture is shown in the image?
- Greenstick
 - Impacted
 - Comminuted
 - Transverse

Ans :

(b) Impacted

- (ii) Which statement accurately describes an impacted fracture?
- The bone breaks diagonally.
 - The bone shatters into multiple fragments.
 - One fragment of bone is driven into the other.
 - The bone bends without fully breaking.

Ans :

- (c) One fragment of bone is driven into the other
- (iii) Which of the following is a common cause of an impacted fracture?
- A slow twisting motion
 - Low-impact collision
 - High-impact fall or forceful collision
 - Gradual overuse

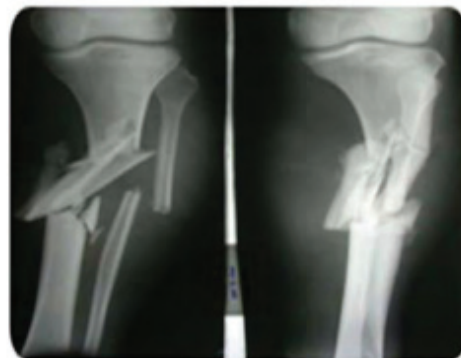
Ans :

- (c) High-impact fall or forceful collision
- (iv) What is a likely treatment for an impacted fracture?
- Simple rest without immobilization
 - Surgical realignment and stabilization
 - Massage therapy to relieve pain
 - No treatment is needed if pain subsides

Ans :

(b) Surgical realignment and stabilization

153. In reference to the picture answer the following questions :



- (i) Which type of fracture is shown in the image?
- Greenstick
 - Comminuted
 - Transverse
 - Impacted

Ans :

(b) Comminuted

- (ii) Which statement best describes a comminuted fracture?
- The bone bends but does not break completely.
 - The bone splits into multiple pieces.
 - The bone breaks in a clean, straight line.
 - One piece of bone is forced into another.

Ans :

(b) The bone splits into multiple pieces

- (iii) Which of the following is a common cause of comminuted fractures?
- Minor twisting injuries
 - Low-intensity exercises
 - High-impact collisions or falls
 - Gradual wear and tear over time

Ans :

(c) High-impact collisions or falls

- (iv) Which treatment approach is often required for a comminuted fracture?
- Simple rest and elevation
 - Massage therapy
 - Immobilization combined with surgical intervention
 - Over-the-counter painkillers only

Ans :

- ii. Prevention: Regular physical activity and weight-bearing exercises help strengthen and densify the bones. Additionally, consuming foods rich in calcium and maintaining a consistent exercise regimen further fortify bone strength.
- iii. Treatment: Transverse fractures can often be managed at home with rest and medication, while a back brace (referred to as a TSL) or an abdominal binder may be prescribed to limit movement at the fracture site and alleviate pain.

142. Discuss the preventive measure of sports injuries.

Ans :

OD 2020

Due to the high intensity and frequency of their training, competitive athletes often find it challenging to avoid sports injuries. Nonetheless, taking simple precautions and following preventive practices can significantly reduce the risk of injury.

1. Warming Up : Properly warming up before engaging in vigorous exercise or participating in an intense game is crucial. An effective warm-up routine should last at least 10 minutes. Start with a few minutes of light activity, such as walking or jogging, to stimulate blood flow to the muscles. Gradually increase the pace until you reach a running level. Once your muscles are adequately warmed, perform gentle stretching exercises, focusing particularly on the muscle groups that will be actively used.
2. Conditioning : Especially when there is a change in climate, it is important to condition the body, which may include a period of heat acclimatization over several days. As part of their pre-participation evaluation, athletes should be assessed for cardio-respiratory fitness, flexibility, and muscle strength. Those with an increased risk of injury due to weakness or tightness should follow an individualized exercise program tailored to address these issues.

143. What are the causes of 'Sports-Injuries'? How Sports-Injuries can be prevented? Explain briefly.

Ans :

Delhi 2017

1. Causes of Sports Injuries:
 - i. Overuse : Repetitive movements or overuse is widely recognized as the leading cause of sports injuries. Athletes such as runners, swimmers, and tennis

players are especially vulnerable to overuse injuries, which include conditions like tennis elbow, tendinitis, shin splints, and shoulder impingement.

- ii. Stops and Twists : Sports that involve rapid stopping and twisting actions—such as basketball, gymnastics, and soccer—often see a high incidence of knee and ankle injuries due to the sudden changes in direction and force applied to the joints.
 - iii. Falls : Any athlete can experience a fall during an activity. Besides the obvious risk of fractures from a fall, wrist sprains are common. This is because when falling, the instinct is to extend one's hands to break the fall, placing significant strain on the wrists that can stretch or tear ligaments.
 - iv. Lack of Fitness and Nutritional Inadequacy : Poor physical conditioning, either alone or combined with inadequate nutritional habits (especially an imbalanced electrolyte profile), can lead to injuries in competitive sports. Insufficient fitness levels or nutrition can impair performance and increase the risk of injury.
 - v. Improper Equipment : Using equipment that is not appropriate for the athlete can also result in injuries. For example, using an overly heavy racquet in tennis or a heavy bat in cricket can cause strain and injury. Similarly, runners may suffer injuries if their shoes do not offer adequate support.
2. Prevention of Sports Injuries : Due to the high intensity and frequency of training, competitive athletes face challenges in avoiding sports injuries. However, simple precautions and practices can significantly reduce injury risks.
- i. Warm-Up : Warming up properly before engaging in vigorous exercise or participating in an intense game is crucial. A proper warm-up should last at least 10 minutes, beginning with a few minutes of light exercise, such as walking or jogging, to stimulate blood flow to the muscles. Gradually increase the pace until reaching a running level, then perform gentle stretching exercises focusing on the muscle groups that will be actively used.

Ans :

- (b) Using a sterile dressing or bandage

156. In reference to the picture answer the following questions :



- (i) Which type of soft tissue injury is shown in the image?
- Laceration
 - Abrasion
 - Contusion
 - Incision

Ans :

- (c) Contusion
- (ii) Which of the following typically causes a contusion?
- Sharp object cutting the skin
 - Friction scraping off skin layers
 - Blunt trauma that damages underlying tissue
 - Deep puncture from a pointed instrument

Ans :

- (c) Blunt trauma that damages underlying tissue
- (iii) What is a common first-aid approach to treat a contusion?
- Applying firm pressure to cause bleeding
 - Using cold therapy (ice pack) to reduce swelling
 - Massaging the area immediately
 - Leaving it uncovered to let air help it heal

Ans :

- (b) Using cold therapy (ice pack) to reduce swelling
- (iv) Which symptom is most closely associated with a contusion?
- Sharp, uneven wound edges
 - Skin layers scraped away
 - A bluish or purplish discoloration
 - Visible bone fragments

Ans :

- (c) A bluish or purplish discoloration

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4. FRICTION & ITS ROLE IN SPORTS

4.1 Definition of Friction

Friction is the resistive force that occurs when two surfaces interact, opposing their relative motion. It plays a dual role in sports, acting both as an ally and an obstacle depending on the situation.

4.2 Types of Friction

1. **Static Friction:** This is the frictional force that prevents surfaces from starting to move against each other. It is the force that athletes must overcome to initiate movement, such as a sprinter pushing off the starting blocks.
2. **Kinetic Friction:** Once motion begins, kinetic friction takes over, acting between moving surfaces. This type of friction is important in determining the speed and control of movement, for example, in sliding sports like ice hockey or skiing.

4.3 Application in Sports

1. **Traction and Performance :** In sports like football, basketball and running, the grip between footwear and the playing surface is critical. High friction provides the necessary traction for quick starts, stops, and rapid directional changes. For instance, the texture and material of athletic shoes are designed to maximize grip while minimizing slippage.
2. **Equipment and Surface Interaction :** Sports equipment and playing surfaces are engineered with friction in mind. In ice skating and skiing, low-friction surfaces enable smooth and continuous motion, while in sports like tennis or badminton, the court surface is optimized to balance speed and control.
3. **Injury Prevention :** Managing friction effectively can reduce the risk of falls and injuries. Training techniques often focus on improving an athlete's ability to adapt to different friction levels—for example, switching from dry to wet conditions—thereby enhancing safety during competitions.
4. **Innovations in Gear :** Advances in materials science have led to the development of sports gear that optimizes friction. Modern footwear, for instance, features specialized outsoles designed to adapt to various surfaces, enhancing both performance and safety.

5. PROJECTILE MOTION IN SPORTS

5.1 Fundamentals of Projectile Motion

1. **Definition :** Projectile motion involves the motion of an object that is thrown or projected into the air, subject only to the acceleration due to gravity. This motion results in a curved, parabolic trajectory.
2. **Key Parameters :**
 - (i) **Initial Velocity:** The speed at which the object is launched determines how far and fast it travels.
 - (ii) **Angle of Projection:** The angle at which the object is launched relative to the horizontal influences the height and range of its path.
 - (iii) **Trajectory Analysis:** The study of the curved path, including factors like maximum height, time of flight, and horizontal distance, is essential to understanding projectile motion.

5.2 Application in Sports

1. **Ball Games and Trajectory:** In sports such as basketball, cricket, football, and baseball, understanding projectile motion helps athletes predict the path of a ball. Coaches analyze the optimal release angle and force to maximize accuracy and distance during throws, passes, or kicks.
2. **Optimizing Performance in Field Events:** Events like javelin throw, shot put, and long jump rely heavily on projectile motion principles. Athletes must find the perfect balance between initial speed and the angle of projection to achieve maximum distance or height.
3. **Training and Technique:** Drills often include exercises that focus on refining the angle and force of projection. Through repetitive practice and video analysis, athletes learn to optimize their launch parameters, resulting in improved performance in competitions.
4. **Impact of Environmental Factors:** Factors such as wind speed and air resistance also influence projectile motion. Athletes and coaches study these variables to adjust strategies during outdoor competitions, ensuring that techniques are adapted for optimal performance under varying conditions.

3. Third-Class Lever: In this arrangement, the effort is applied between the fulcrum and the load. The human forearm during a bicep curl is a perfect illustration; this setup enables a rapid movement even though the force needed is greater compared to other lever types.

2.3 Application in Sports

1. Biomechanical Efficiency : Athletes naturally employ lever systems in nearly every movement. For instance, a baseball pitcher uses the lever mechanism of their arm to maximize the speed of the ball. The positioning of the shoulder (fulcrum) and the alignment of the arm (effort and load) directly affect the throwing speed.
2. Enhancing Performance Through Technique: In sports like tennis, golf, and cricket, the lever action of the limbs is critical. By understanding the ideal angles and positions of the limbs, athletes can generate greater force and precision. A golfer's swing, for example, is refined by adjusting the distance between the hands (effort) and the club head (load) relative to the pivot point.
3. Injury Prevention and Equipment Design: Knowledge of lever mechanics is instrumental in designing sports equipment and training programs. Proper training can enhance the natural lever actions of the body, minimizing undue stress on joints. This understanding leads to better-designed footwear, protective gear, and sports implements that support the body's natural mechanics while reducing the risk of strains or injuries.
4. Practical Drills: Many sports training programs incorporate exercises that focus on improving leverage. Drills that emphasize proper limb alignment, body rotation, and coordinated movements help athletes maximize their mechanical advantage, leading to enhanced performance and efficiency.

3. EQUILIBRIUM – DYNAMIC & STATIC AND CENTRE OF GRAVITY AND THEIR APPLICATION IN SPORTS

3.1 Equilibrium in Physics

1. Static Equilibrium: This state occurs when an object is at rest, and the sum of all forces and torques acting on it is zero. An athlete holding a yoga pose or a gymnast maintaining balance on a beam are practical examples of static equilibrium in action.

2. Dynamic Equilibrium : When an object moves at a constant velocity with all forces balanced, it is in dynamic equilibrium. In sports, this is seen when a cyclist rides at a steady speed on a level road, with propulsion and friction forces counteracting each other.

3.2 Centre of Gravity

1. Definition and Importance : The centre of gravity is the point at which the entire weight of an object is considered to be concentrated. In human movement, it is critical for maintaining balance and stability.
2. Factors Influencing Centre of Gravity: Changes in body position, posture, and distribution of mass can shift the centre of gravity. Athletes train to control these shifts to maintain balance during complex movements.

3.3 Application in Sports

1. Improving Balance and Stability: In sports such as gymnastics, figure skating, and skateboarding, the position of the centre of gravity is pivotal. Athletes learn to adjust their body posture to keep the centre of gravity within the base of support, which is essential for balance during flips, spins, or tightrope walks.
2. Optimizing Movement in Dynamic Sports: In high-speed sports like cycling, skiing, and motor racing, athletes manipulate their centre of gravity to enhance maneuverability. Cyclists lean into curves to counterbalance centrifugal forces, while skiers shift their body weight to control turns and maintain stability on slopes.
3. Tactical Applications : In team sports such as football and rugby, players often lower their centre of gravity to gain stability during tackles or sudden directional changes. This technique improves contact stability and helps in maintaining control even when facing heavy physical opposition.
4. Training Focus : Coaches frequently design exercises that target balance and proprioception. Balance boards, stability balls, and core strengthening routines help athletes better control their centre of gravity, leading to more efficient and safe movement patterns during competition.

6. Physical education teacher of XYZ school explained how Newton's law of motions are used in sports. She explained while dribbling in Basketball, how the laws can be helpful. Which law of motion is shown in picture?



- (a) Law of Inertia
(b) Law of Acceleration
(c) Law of Action and Reaction
(d) Both (a) and (b)

Ans :

Term-I, 2021-22

- (c) Law of Action and Reaction

When the person pushes the paddle against the water, the water exerts an equal and opposite force on the paddle. This reaction propels the boat forward. The interaction clearly demonstrates Newton's 3rd law, the law of action and reaction.

7. In general sports biomechanics is a quantitative based study and analysis of professional athletes and sports activities. It explains how and why the human body moves in the way that it does. Following are the importance of biomechanics, except.
- (a) Improvement in training
(b) Improvement in equipment
(c) Improvement in performance
(d) Improvement in aesthetic

Ans :

Term-I, 2021-22

- (d) Improvement in aesthetic

Biomechanics primarily focuses on enhancing training techniques, designing better sports equipment, and improving athletic performance through the analysis of movement. It is not directly concerned with aesthetic improvements, which pertain more to artistic presentation rather than performance optimization.

8. The Law of acceleration is also known as _____.
(a) Law of inertia
(b) Law of action and reaction
(c) Law of momentum
(d) Boyle's law

Ans :

SQP 2020

- (c) Law of momentum

Newton's second law relates acceleration to the net force and mass, describing how momentum changes with force. Hence, it is often referred to as the law of momentum since force produces a change in momentum over time.

9. Bio-mechanics helps in which of the following ?
(a) In improving technique
(b) In improving designs of sports equipment
(c) In improving performance
(d) All of these

Ans :

OD 2020

- (d) All of these

Biomechanics plays a critical role in sports by helping athletes improve their techniques, refining sports equipment design, and enhancing overall performance. Its multifaceted approach ensures athletes benefit in all areas—from training and execution to injury prevention.

10. Identify the factor which decreases equilibrium.
(a) Larger base
(b) Greater weight
(c) Lower centre of gravity
(d) Higher centre of gravity

Ans :

2024

- (d) Higher centre of gravity

Equilibrium is less stable when an object's centre of gravity is higher, making it easier to tip over. While a larger base, lower centre of gravity, and greater weight (properly distributed) typically increase stability, a higher centre of gravity decreases equilibrium.

11. Centre of Gravity is the average location of an object's _____.
(a) Weight
(b) Force
(c) Resistance
(d) Velocity

Ans :

2023

- (a) Weight

The centre of gravity represents the point at which the total weight of an object is concentrated. It is the balance point where the gravitational force effectively acts, making weight the primary factor in determining the centre of gravity.

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MULTIPLE CHOICE QUESTION

1. Chopra will be done under

- (a) Biology
- (b) Biomechanics
- (c) Physiology
- (d) Anatomy.

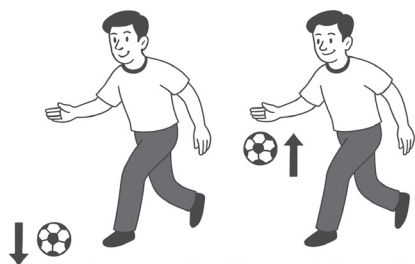
Ans :

Term-I, 2021-22

(b) Biomechanics

The topic “Chopra” is linked to the quantitative study of human movement, forces, and energy transfer, which are central to biomechanics. Unlike biology, physiology, or anatomy, biomechanics focuses on applying mechanical principles to human motion.

2. Which Newton’s law of motion is depicted through the picture?



Rebound of a rubber ball

- (a) Newton’s 3rd law
- (b) Newton’s 2nd law
- (c) Newton’s 1st law
- (d) Newton’s 1st and 2nd law

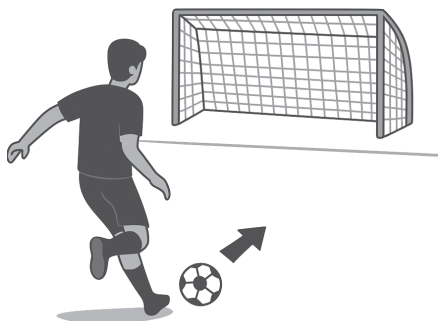
Ans :

Term-I, 2021-22

(a) Newton’s 3rd law

When the rubber ball strikes the surface, it applies a force on the surface. The surface responds by exerting an equal and opposite force on the ball, causing it to rebound. This direct action-reaction relationship exemplifies Newton’s 3rd law of motion.

3. Which Newton’s law of motion is depicted through this picture?



- (a) Newton’s 1st law of motion
- (b) Newton’s 2nd law of motion
- (c) Newton’s 3rd law of motion
- (d) Both (a) and (b)

Ans :

Term-I, 2021-22

(d) Both (a) and (b)

Initially, the stationary ball remains at rest (Newton’s 1st law) until the player’s kick provides the force to move it. The acceleration of the ball is then determined by the magnitude of that force relative to the ball’s mass (Newton’s 2nd law).

4. Heading the football into opposition goal post through a corner kick is an example of

- (a) Newton’s 1st law of motion
- (b) Newton’s 2nd law of motion
- (c) Newton’s 3rd law of motion
- (d) Both (a) and (b).

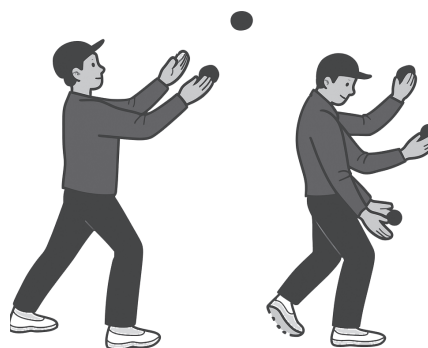
Ans :

Term-I, 2021-22

(d) Both (a) and (b)

During a corner kick, the ball continues in motion due to inertia (Newton’s 1st law), and the force applied by the kicker changes its speed and direction (Newton’s 2nd law). Both laws work together to explain the ball’s movement.

5. Identify the law of motion, shown in the illustration:



- (a) Law of Inertia
- (b) Law of Action and Reaction
- (c) Law of Acceleration
- (d) Both (b) and (c)

Ans :

Term-I, 2021-22

(d) Both (b) and (c)

The illustration shows the ball’s acceleration changing due to the force applied (Law of Acceleration), and it also demonstrates equal and opposite forces between the ball and hands (Law of Action and Reaction). Hence, both laws (b) and (c) are involved.

to start the motion is a clear demonstration of the first law of motion, where an object at rest remains at rest until a net force acts upon it.

- 19. Assertion (A) :** A change in the acceleration of an object is directly proportional to the force producing it and inversely proportional to its mass.

Reason (R) : Lighter mass will travel at a faster speed.

- (a) Both A and R are true, but R is not the correct explanation of A.
- (b) Both A and R are true and R is the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

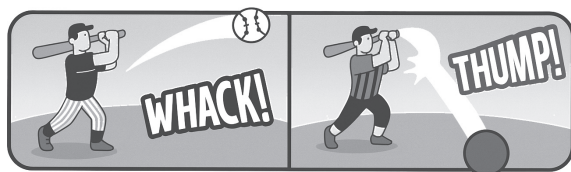
Ans :

Term-I, 2021-22

- (b) Both A and R are true and R is the correct explanation of A.

The assertion correctly states the relationship between force, mass, and acceleration, and the reason explains that a lighter mass accelerates faster for a given force. This direct relationship confirms that the reason correctly explains the assertion.

20.



Physical education teacher of ABC school was teaching the students about Newton's Laws of Motion. While explaining he showed the students this picture and tried to explain how there is a difference in the speed of an object due to their weight. Can you name the Law?

- (a) Newton's First Law of Motion
- (b) Newton's Second Law of Motion
- (c) Newton's Third Law of Motion
- (d) Action Reaction

Ans :

Term-I, 2021-22

- (b) Newton's Second Law of Motion

When two objects are struck with the same force, the lighter object accelerates more than the heavier one. This scenario exemplifies Newton's Second Law, which states that acceleration is directly proportional to force and inversely proportional to the mass involved.

- 21.** Rishi who was studying in class XII is a science stream student. During his Physical Education class, he got confused how Newton's laws of Motion are useful in sports and how they can be applied in sports. But his teacher explained these laws with help of examples from sports which proved to be very helpful for him. Swimming is the best example of which law of motion?

- (a) Law of inertia
- (b) Law of acceleration
- (c) Law of reaction
- (d) Both (a) and (c)

Ans :

Term-I, 2021-22

- (d) Both (a) and (c)

Friction always opposes the direction of motion, acting to reduce speed and eventually bring moving objects to a stop. This opposing force is critical for controlling motion in sports, ensuring stability and safety during rapid movements.

- 22.** The Friction force acts in a/an _____ direction to the direction of motion of an object.

- (a) Opposite
- (b) Same
- (c) Downwards
- (d) Diagonal

Ans :

2023-24

- (a) Opposite

Friction always opposes the direction of motion, acting to reduce speed and eventually bring moving objects to a stop. This opposing force is critical for controlling motion in sports, ensuring stability and safety during rapid movements.

- 23.** Newton's First Law of Motion states that an object at rest remains at rest, and an object in motion continues in motion unless acted upon by an unbalanced force. Which option best describes this law?

- (a) Inertia
- (b) Momentum
- (c) Acceleration
- (d) Friction

Ans :

- (a) Inertia

Newton's First Law of Motion asserts that an object at rest remains at rest and an object in motion continues moving unless an external unbalanced force acts upon it. This property of inertia is fundamental in understanding the behavior of objects in sports.

12. Movement possible in Ball and Socket joint are :

- (a) Rotation
- (b) Flexion
- (c) Extension
- (d) All of the above.

Ans :

DELHI 2020

(d) All of the above

Ball and socket joints, such as the shoulder and hip joints, allow a wide range of motions including rotation, flexion, and extension. This versatility makes them ideal for complex movements required in many sports and daily activities.

13. The force of friction depends upon

- (a) Nature of surface of contact
- (b) Material of objects in contact
- (c) Both (a) and (b)
- (d) None of the above.

Ans :

SQP 2020

(c) Both (a) and (b)

Friction is influenced by the nature of the surfaces in contact (roughness, texture) and the materials involved. These factors determine the amount of resistance when surfaces slide against each other, affecting performance and safety in various sporting activities.

14. Which of the following is NOT the factor affecting projectile trajectory?

- (a) Gravity
- (b) Angle of Release
- (c) Buoyant Force
- (d) Air Resistance

Ans :

2023

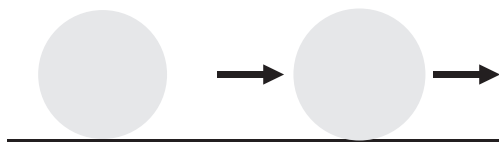
(c) Buoyant Force

In projectile motion, gravity, the angle of release, and air resistance significantly influence the trajectory. Buoyant force, however, is generally negligible for typical sports projectiles, making it the factor that does not affect the projectile's path.

15. Identify the given below.

With no outside forces, a stationary object will not move

With no outside forces, a moving object will not stop



- (a) First law of motion
- (b) Second law of motion
- (c) Third law of motion
- (d) Law of effects

Ans :

2023-24

(b) Second law of motion

Newton's Second Law states that acceleration depends on the net external force. If no force acts, acceleration is zero. Thus, a stationary object remains at rest, and a moving object keeps moving at constant speed—demonstrating the principle of no force, no change.

16. Who gave Laws of motion?

- (a) Galileo
- (b) Pascal
- (c) Newton
- (d) Darwin

Ans :

Term-I, 2021-22

(c) Newton

Sir Isaac Newton formulated the three fundamental laws of motion. His work laid the groundwork for classical mechanics, establishing the principles that govern the relationship between forces and motion in all physical systems, including sports biomechanics.

17. Which law amongst the given ones is known as the First law of motion?

- (a) Law of inertia
- (b) Law of reaction
- (c) Law of momentum
- (d) Law of acceleration

Ans :

Term-I, 2021-22

(a) Law of inertia

The first law of motion, or the law of inertia, states that an object remains at rest or in uniform motion unless acted upon by an external force. This principle is essential for understanding how objects behave in motion and at rest.

18. Starting a throwing event in athletics is an example of which law of motion?

- (a) First law of motion
- (b) Second law of motion
- (c) Third law of motion
- (d) First and third law of motion

Ans :

Term-I, 2021-22

(a) First law of motion

In throwing events, athletes must overcome the inertia of the object. The initial force applied

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- 30.** Which lever type is commonly found in a wheelbarrow, where the load is between the fulcrum and the effort?

(a) First-class lever
(b) Second-class lever
(c) Third-class lever
(d) Compound lever

Ans :

COMP 2013

(b) Second-class lever

A second-class lever places the load between the fulcrum and the effort. This configuration provides a mechanical advantage, as seen in a wheelbarrow, where a relatively small effort can lift a heavy load, benefiting activities requiring force amplification in sports equipment.

- 31.** In which lever type is the effort applied between the fulcrum and the load?

(a) First-class lever
(b) Second-class lever
(c) Third-class lever
(d) Compound lever

Ans :

DELHI 2011

(c) Third-class lever

In a third-class lever, the effort is applied between the fulcrum and the load. This arrangement is common in the human body, such as in the biceps curl, where muscles apply force to move the forearm, providing speed and range of motion in athletic activities.

- 32.** The center of gravity is defined as:

(a) The point where weight is evenly distributed
(b) The location of maximum mass
(c) The point of highest energy
(d) The area with greatest friction

Ans :

OD 2005

(a) The point where weight is evenly distributed
The center of gravity is the point at which an object's mass is evenly distributed in all directions. It is crucial for stability and balance in sports, as proper alignment of the center of gravity ensures efficient movement and reduced risk of falls or injuries.

- 33.** Static equilibrium in sports refers to a state where:

(a) Objects are moving uniformly
(b) Forces are balanced and there is no net motion
(c) Acceleration is maximized
(d) Friction is absent

Ans :

FOREIGN 2012

(b) Forces are balanced and there is no net motion
Static equilibrium occurs when all forces acting on an object are balanced, resulting in no net motion. In sports, this concept is essential for maintaining stability in a stationary position, such as a gymnast holding a pose or an athlete balancing on one leg.

- 34.** Dynamic equilibrium in sports is characterized by:

(a) Constant motion with balanced forces
(b) A complete lack of movement
(c) Uncontrolled acceleration
(d) Maximum friction

Ans :

SQP 2010

(a) Constant motion with balanced forces

Dynamic equilibrium describes a state of constant motion where forces remain balanced. In sports, this occurs when athletes perform continuous movements with stability, such as a runner maintaining a steady pace, despite external forces acting on their body during activity.

- 35.** How does a lower center of gravity benefit athletes?

(a) It decreases stability
(b) It increases speed only
(c) It enhances balance and reduces fall risk
(d) It increases vertical jump height

Ans :

COMP 2002

(c) It enhances balance and reduces fall risk

A lower center of gravity enhances an athlete's balance and stability by reducing the moment arm of gravitational force. This biomechanical advantage is crucial in sports, as it decreases the likelihood of falls and enables more controlled, agile movements during competition.

- 36.** Friction in sports plays an important role by:

(a) Preventing movement completely
(b) Aiding traction and controlling motion
(c) Reducing energy expenditure
(d) Eliminating wear and tear

Ans :

DELHI 2006

(b) Aiding traction and controlling motion

Friction provides the necessary traction between surfaces, allowing athletes to control their movements, accelerate, and decelerate effectively. It is crucial for performance, as proper friction levels enable safe execution of techniques while minimizing the risk of slipping during play.

- 24.** In sports, Newton's First Law is evident when a stationary athlete remains motionless until a force initiates movement. Which factor is primarily responsible for this behavior?

(a) Gravity
(b) Inertia
(c) Air resistance
(d) Friction

Ans :

SQP 2020

(b) Inertia

In sports, inertia causes a stationary athlete to remain motionless until an external force, such as a push or pull, initiates movement. This principle explains why objects and bodies resist changes in their state of motion until acted upon by sufficient external forces.

- 25.** Newton's Second Law states that Force equals mass times acceleration ($F = ma$). How does this law apply to an athlete accelerating on a track?

(a) Greater mass decreases acceleration
(b) Force is independent of mass
(c) Higher force increases acceleration
(d) Acceleration remains constant regardless of force

Ans :

COMP 2018

(c) Higher force increases acceleration

According to Newton's Second Law, applying a greater force on an athlete will result in a higher acceleration, provided the mass remains constant. This principle is essential in sports, as athletes train to maximize force production for improved speed and performance.

- 26.** Newton's Third Law of Motion states that for every action, there is an equal and opposite reaction. Which sports example best illustrates this law?

(a) A runner pushing off the starting blocks
(b) A cyclist maintaining balance
(c) A swimmer gliding in water
(d) A gymnast performing a balance beam routine

Ans :

DELHI 2016

(a) A runner pushing off the starting blocks

When a runner pushes off the starting blocks, the force exerted on the blocks is met with an equal and opposite force propelling the runner forward. This action-reaction pair exemplifies Newton's Third Law, critical for initiating motion in many sports.

- 27.** In a game of soccer, when a player kicks a stationary ball, the ball moves in the direction of the kick. Which Newton's law explains this behavior?

(a) First Law
(b) Second Law
(c) Third Law
(d) Law of Conservation of Energy

Ans :

OD 2014

(b) Second Law

Newton's Second Law explains that the force applied by the player's foot (F) to the ball, relative to its mass (m), produces acceleration (a) in the ball. This relationship, $F = ma$, is fundamental in understanding how force influences ball motion in sports.

- 28.** A diver tucks during a dive to rotate faster. Which biomechanical principle primarily explains the increased rotational speed?

(a) Conservation of momentum
(b) Increased mass
(c) Greater friction
(d) Higher acceleration

Ans :

FOREIGN 2019

(a) Conservation of momentum

When a diver tucks in, they reduce their moment of inertia, and by the principle of conservation of angular momentum, their rotational speed increases. This biomechanical strategy enables faster spins during dives, enhancing performance in aerial maneuvers.

- 29.** Which type of lever has the fulcrum located between the effort and the load?

(a) First-class lever
(b) Second-class lever
(c) Third-class lever
(d) Compound lever

Ans :

SQP 2015

(a) First-class lever

In a first-class lever, the fulcrum is positioned between the effort and the load. This arrangement allows for the reversal of force direction and is seen in movements such as the neck's nodding motion, illustrating basic lever mechanics in sports and daily activities.

NODIA

CHAPTER 8

BIOMECHANICS AND SPORTS

SUMMARY

1. NEWTON'S LAWS OF MOTION & THEIR APPLICATION IN SPORTS

1.1 Overview of Newton's Laws

1. First Law (Law of Inertia) : An object remains at rest or continues moving at a constant velocity in a straight line unless acted upon by an external force. This principle explains why athletes must exert a significant initial force to start moving or change their state of motion.
2. Second Law (Law of Acceleration) : The acceleration produced by a force is directly proportional to the magnitude of that force and inversely proportional to the mass of the object (expressed as $F = ma$). This relationship is crucial in understanding how changes in force or mass affect the speed and acceleration of moving objects.
3. Third Law (Action and Reaction) : Every action has an equal and opposite reaction. This law is evident in every sports activity where forces interact—such as the force exerted by a sprinter's foot against the starting blocks or the impact of a bat on a ball.

1.2 Application in Sports

1. Overcoming Inertia: In activities like sprinting, a cyclist racing off the starting line, or a weightlifter beginning a lift, overcoming the inertia of the body is essential. Athletes use explosive power to generate the force needed to initiate movement, directly applying Newton's First Law.
2. Optimizing Acceleration : In sports like cricket, baseball, and athletics, the acceleration of a ball or an athlete is determined by the force applied and the mass involved. For instance, a cricketer's powerful swing involves optimizing

force to maximize ball speed, while a runner uses leg muscles to apply force that accelerates their body forward.

3. Action-Reaction Dynamics: Every jump, push, or kick is an interplay of forces. For example, a swimmer pushes water backward, and the water, in turn, propels the swimmer forward. Similarly, a basketball player uses the force of their legs pushing against the floor to achieve lift during a jump. Recognizing these dynamics helps in refining techniques for better energy transfer and performance.
4. Real-World Analysis: Coaches often analyze athletes' movements by applying Newton's laws. Video analysis may reveal inefficiencies in motion, prompting adjustments in technique that align with the principles of force and acceleration. Such scientific insights help in tailoring training regimens to improve speed, power, and overall performance.

2. TYPES OF LEVERS AND THEIR APPLICATION IN SPORTS

2.1 Definition and Components of Lever

A lever is a simple machine consisting of a rigid bar that rotates around a fixed point known as the fulcrum. The three key parts are the effort (the force applied), the load (the weight or resistance), and the fulcrum (the pivot point).

2.2 Classification of Levers

1. First-Class Lever : In this type, the fulcrum is located between the effort and the load. A seesaw is a classic example, where the positions of the fulcrum, load, and effort can be adjusted to change the outcome.
2. Second-Class Lever : Here, the load lies between the fulcrum and the applied force. An example is a wheelbarrow, where the design allows a smaller force to lift a heavier load by positioning the load close to the wheel (fulcrum).

37. Which factor increases friction between two surfaces in sports?

(a) Smooth surfaces
(b) Increased roughness
(c) High humidity only
(d) Decreased weight

Ans :

OD 2008

(b) Increased roughness

Increased roughness of contact surfaces enhances friction by creating more resistance to sliding. In sports, this principle is utilized in equipment design and footwear to provide better grip and control, which are essential for both performance and injury prevention during dynamic movements.

38. Projectile motion in sports involves which of the following components?

(a) Constant speed
(b) Only vertical motion
(c) Both horizontal and vertical motion
(d) Only horizontal motion

Ans :

FOREIGN 2003

(c) Both horizontal and vertical motion

Projectile motion involves the simultaneous horizontal and vertical components of movement. In sports, objects like balls follow curved trajectories influenced by initial velocity, launch angle, and gravity. Understanding this motion is critical for predicting and optimizing performance in throwing and kicking events.

39. In projectile motion, which factor primarily determines the range of a projectile?

(a) Launch angle
(b) Color of the object
(c) Ambient temperature
(d) Material composition

Ans :

SQP 2007

(a) Launch angle

The launch angle is a crucial factor determining the range of a projectile. An optimal angle, typically around 45 degrees under ideal conditions, maximizes horizontal displacement. Adjustments in angle directly influence trajectory and distance, making this parameter critical in sports performance analysis.

40. Which Newton's law is most directly related to the concept of impulse in sports?

(a) First Law
(b) Second Law
(c) Third Law

(d) Law of Gravitation

Ans :

COMP 2004

(b) Second Law

Newton's Second Law relates force, mass, and acceleration, forming the basis for understanding impulse—the product of force and time. In sports, impulse explains how the duration of force application affects momentum changes during actions such as striking or catching a ball effectively.

41. How does an increase in an athlete's mass affect acceleration, according to Newton's Second Law?

(a) Increases acceleration
(b) Has no effect
(c) Decreases acceleration
(d) Causes constant acceleration

Ans :

DELHI 2001

(c) Decreases acceleration

Newton's Second Law ($F = ma$) indicates that for a given applied force, an increase in mass results in a decrease in acceleration. This principle is important in sports, as heavier athletes require greater force to achieve the same acceleration as lighter competitors, affecting performance.

42. Which lever type in sports provides a mechanical advantage by multiplying the applied force?

(a) First-class lever
(b) Second-class lever
(c) Third-class lever
(d) Compound lever

Ans :

OD 2009

(b) Second-class lever

A second-class lever provides a mechanical advantage by positioning the load between the fulcrum and the effort. This configuration multiplies the applied force, making tasks like lifting heavy objects easier. Such principles are applied in various sports and exercise equipment to enhance performance.

43. In a third-class lever, how is the effort applied relative to the fulcrum and load?

(a) Beyond the load
(b) Between the fulcrum and load
(c) At the load
(d) At the fulcrum

Ans :

FOREIGN 2017

(b) Between the fulcrum and load

Ans :

COMP 2014

(b) Position of the body

The center of gravity shifts based on body posture. A stretched position raises it, while bending lowers it, affecting balance and stability.

81. Centre of gravity is the average location of an object's
- weight
 - force
 - balance
 - velocity

Ans :

DELHI 2016

(a) Weight

The center of gravity is the point where an object's total weight is concentrated, determining its balance and stability during movement.

82. The Friction force acts in a/an _____ direction to the direction of motion of an object.
- opposite
 - same
 - downwards
 - diagonal

Ans :

OD 2018

(a) Opposite

Friction opposes motion, slowing objects down. It counteracts the applied force, preventing excessive acceleration or maintaining control in sports.

83. Among the following sports, in which does friction plays the least important role?
- Car Race
 - Football
 - Hockey
 - Ice Skating

Ans :

SQP 2020

(d) Ice Skating

Ice skating involves minimal friction as the smooth ice surface reduces resistance, allowing effortless gliding. Other sports rely more on friction for movement and control.

84. Friction is a _____
- Magnetic Force
 - Non-contact Force
 - Contact Force
 - Couple Force

Ans :

COMP 2017

(c) Contact Force

Friction occurs when two surfaces are in direct contact, resisting relative motion. It depends on texture, surface roughness, and the applied force.

85. Cyclist often wears streamlined helmets and specially designed clothing to reduce Calibration
- Fluid Friction
 - Rolling Friction
 - Sliding Friction
 - None of the above

Ans :

DELHI 2009

(a) Fluid Friction

Fluid friction, or air resistance, slows down moving bodies. Streamlined gear reduces drag, helping cyclists maintain speed with less effort.

86. Factors that bring air resistance into play
- Larger the surface area
 - Rough surface
 - Smaller the mass
 - All of the above

Ans :

OD 2001

(d) All of the above

Larger surface area, rough textures, and smaller mass increase air resistance, affecting motion by slowing objects down or altering trajectories.

The motion of a projectile is due to two separates simultaneously occurring components of motion and they are

- One along the vertical
- One along the horizontal
- both a and b
- none of above

Ans :

FOREIGN 2004

(c) Both (a) and (b) (One along vertical, one along horizontal)

A projectile moves both horizontally (constant speed) and vertically (affected by gravity), forming a curved trajectory.

88. According to Professor John Fontanella, the ideal angles from the freethrow line will vary from _____ to _____ with shorter players.
- 48.7 degrees to 52.2 degrees,
 - 45.6 degrees and 50.2 degrees,
 - No specific degree
 - Any degree

Ans :

SQP 2007

(a) 48.7 degrees to 52.2 degrees

- 50.** Which principle best explains the behavior of a thrown ball following a curved trajectory?

(a) Newton's First Law
(b) Conservation of momentum
(c) Projectile motion
(d) Mechanical advantage

Ans :

COMP 2003

(c) Projectile motion

Projectile motion principles explain the curved trajectory of a thrown ball. The combination of initial velocity, gravitational force, and launch angle creates a parabolic path. This concept is fundamental in analyzing ball sports, where trajectory determines accuracy and range.

- 51.** In weightlifting, applying Newton's Second Law helps determine that increasing the load requires:

(a) Less acceleration
(b) More acceleration
(c) Constant acceleration regardless of load
(d) No change in force

Ans :

DELHI 2012

(a) Less acceleration

Newton's Second Law ($F = ma$) indicates that for a given force, increasing the load (mass) results in less acceleration. In weightlifting, heavier loads naturally accelerate slower unless additional force is applied, highlighting the inverse relationship between mass and acceleration.

- 52.** The mechanical advantage of a lever in sports is calculated as:

(a) Effort arm length divided by load arm length
(b) Load arm length divided by effort arm length
(c) Sum of effort and load arms
(d) Difference between effort and load arms

Ans :

OD 2019

(a) Effort arm length divided by load arm length
The mechanical advantage of a lever is calculated by dividing the length of the effort arm by the length of the load arm. This ratio indicates how much the applied force is amplified, playing a critical role in biomechanical efficiency and force production in sports movements.

- 53.** Which factor in biomechanics is most affected by air resistance during projectile motion?

(a) Mass
(b) Shape and surface area
(c) Color
(d) Temperature

Ans :

FOREIGN 2014

(b) Shape and surface area

In projectile motion, air resistance is largely influenced by an object's shape and surface area. A streamlined shape reduces drag, allowing for longer flight distances, which is critical for optimizing performance in sports such as cycling, running, and ball games.

- 54.** Which sports activity best demonstrates the application of dynamic equilibrium?

(a) Standing still
(b) A figure skater performing spins
(c) Sitting quietly
(d) Lying down

Ans :

SQP 2011

(b) A figure skater performing spins

A figure skater performing spins demonstrates dynamic equilibrium by maintaining balance while in motion. Despite the rotational forces and external disturbances, the skater's body remains stable, showcasing the continuous adjustment of forces necessary for controlled, fluid movement in sports.

- 55.** How does lowering the center of gravity benefit an athlete in contact sports?

(a) It increases vulnerability
(b) It improves stability and reduces tipping risk
(c) It slows reaction time
(d) It reduces speed

Ans :

COMP 2005

(b) It improves stability and reduces tipping risk
Lowering the center of gravity improves an athlete's stability by decreasing the leverage of external forces. In contact sports, this reduces the risk of being toppled and enhances balance, enabling better maneuverability and improved performance under dynamic physical challenges.

- 56.** Which frictional force is most beneficial for athletes during a sprint?

(a) Static friction
(b) Kinetic friction
(c) Rolling friction
(d) Fluid friction

Ans :

DELHI 2008

(a) Static friction

Static friction is most beneficial during a sprint because it prevents the athlete's foot from slipping on the surface. This frictional force allows for

vertical acceleration due to gravity—making both statements true and directly related.

- 68. Assertion (A) :** Newton's Third Law, which states that every action has an equal and opposite reaction, is evident in sports like rowing and swimming.

Reason (R) : When an athlete applies force to the water, the water exerts an equal and opposite force that propels the athlete forward.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2007

- (a) Both A and R are true, and R is the correct explanation for A

The assertion correctly identifies Newton's Third Law in action during sports activities. The reason clearly describes the reciprocal forces between the athlete and water, providing the necessary propulsion. Both statements are accurate and the reason fully explains the assertion.

- 69. Assertion (A) :** Dynamic equilibrium in sports is achieved when athletes continuously adjust their body position to counteract external forces during movement.

Reason (R) : Dynamic equilibrium means that an athlete remains completely motionless, ensuring balance throughout an activity.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2003

- (c) A is true but R is false

The assertion is true because dynamic equilibrium involves continuous adjustments to maintain balance while in motion. The reason is false, as it incorrectly implies stillness; dynamic equilibrium is characterized by ongoing movement balanced by compensatory actions, not complete immobility.

- 70. Assertion (A) :** In sports, friction plays a critical role not only by providing traction but also by influencing the spin and trajectory of projectiles, such as a spinning football.

Reason (R) : Aerodynamic friction (drag) and the associated Magnus effect alter both the speed and stability of a spinning ball during its flight.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2008

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is accurate since friction affects traction and the behavior of projectiles in flight. The reason is correct—drag and the Magnus effect influence the speed, spin, and trajectory of a ball. Both statements are true and the reason directly explains the assertion.

- 71. According to Newton's Second Law of Motion, the greater the movement of an object, the**

- (a) The longer distance will it travel
- (b) Stronger will it resist the external forces
- (c) Speedier it will cover the given distance
- (d) More stable will it remain in its motion.

Ans :

DELHI 2006

- (c) Speedier it will cover the given distance
- Newton's Second Law states that acceleration is directly proportional to force. A greater force applied to an object results in increased speed over a given distance, making it move faster.

- 72. Newton's First Law of Motion is known as the**

- (a) Law of Reaction
- (b) Law of Inertia
- (c) Law of Effect
- (d) Law of Momentum

Ans :

OD 2002

- (c) Speedier it will cover the given distance
- Newton's Second Law states that acceleration is directly proportional to force. A greater force applied to an object results in increased speed over a given distance, making it move faster.

- 73. Newton's Second Law of Motion is also known as**

- (a) Law of Reaction
- (b) Law of Inertia
- (c) Resultant Force
- (d) Law of Effect

Ans :

FOREIGN 2010

- (c) Resultant Force

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2016

- (a) Both A and R are true, and R is the correct explanation for A

The assertion correctly states that force, mass, and acceleration are closely related. The reason explicitly describes how, in sprinting, increasing force (with constant mass) yields higher acceleration, making both statements true and the reason a proper explanation of the assertion.

- 64. Assertion (A) :** Second-class levers, in which the load is between the effort and the fulcrum, are observed in sports movements such as tip-toe standing and calf raises.

Reason (R) : In a second-class lever, the effort arm is always longer than the load arm, providing a mechanical advantage that amplifies force output.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2017

- (a) Both A and R are true, and R is the correct explanation for A

The assertion correctly identifies the role of second-class levers in actions like tip-toe standing. The reason is accurate, as the typical configuration of a second-class lever does offer a mechanical advantage by having a longer effort arm relative to the load arm, thereby supporting the assertion.

- 65. Assertion (A) :** Maintaining a low centre of gravity is essential for achieving static equilibrium in sports such as wrestling and martial arts.

Reason (R) : A lower centre of gravity reduces the likelihood of toppling by enhancing an athlete's balance and stability, both in static and dynamic situations.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2009

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is valid because a low centre of gravity helps maintain balance. The reason accurately explains that a lower centre of gravity minimizes toppling risk and improves stability, directly supporting both static and dynamic equilibrium, making both statements true and aligned.

- 66. Assertion (A) :** Friction between footwear and the playing surface is crucial in sports, as it provides the necessary traction for effective movement.

Reason (R) : Excess friction always improves performance by preventing slips, regardless of the sport or context.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2001

- (c) A is true but R is false

The assertion is correct since adequate friction ensures proper grip and movement. However, the reason is false because excessive friction can sometimes hinder performance—by restricting movement or causing injuries—so it is not universally beneficial in all sporting contexts.

- 67. Assertion (A) :** The flight of a ball in sports like basketball and football is an example of projectile motion, governed by gravitational acceleration.

Reason (R) : In projectile motion, the horizontal component of velocity remains constant (neglecting air resistance) while the vertical component is influenced by gravity.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2004

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is correct, as the parabolic trajectory of a ball follows the principles of projectile motion. The reason properly explains the physics—constant horizontal velocity and

In a third-class lever, the effort is applied between the fulcrum and the load. This arrangement sacrifices mechanical advantage for speed and range of motion, making it ideal for rapid movements such as throwing and striking in many sports, despite requiring greater force.

- 44.** What does mechanical advantage in levers refer to?
- Increased speed without force
 - Ratio of output force to input force
 - Loss of energy during motion
 - Greater distance traveled

Ans :

SQP 2018

(b) Ratio of output force to input force
Mechanical advantage in levers is the ratio of output force to input force, indicating how effectively a lever amplifies an applied force. This concept is fundamental in biomechanics, as it explains how athletes use their limbs to generate force and enhance performance in sports activities.

- 45.** Dynamic balance in sports is achieved when an athlete maintains equilibrium while:
- Standing still
 - Moving
 - Sitting
 - Lying down

Ans :

COMP 2015

(b) Moving
Dynamic balance is achieved when an athlete maintains equilibrium during movement. This ability is essential in sports requiring rapid changes in direction, as it ensures stability and control while performing actions such as running, jumping, or executing complex maneuvers under varying conditions.

- 46.** Static balance in sports is best demonstrated by an athlete:
- Sprinting
 - Holding a still pose
 - Jumping repeatedly
 - Running in a circle

Ans :

DELHI 2010

(b) Holding a still pose
Static balance is demonstrated when an athlete holds a still pose without movement. This ability indicates that the forces acting on the body are balanced. Static balance is crucial for sports

that require precise control and stability, such as gymnastics and archery.

- 47.** Friction in sports surfaces can be beneficial because it:
- Prevents any movement
 - Provides traction for movement
 - Increases energy loss significantly
 - Causes excessive wear on equipment

Ans :

OD 2007

(b) Provides traction for movement
Friction between sports surfaces and athletic equipment or footwear provides essential traction, enabling controlled movement and stability. Adequate friction helps athletes accelerate, decelerate, and change direction safely, thereby playing a vital role in performance and injury prevention during dynamic activities.

- 48.** In projectile motion, what is the effect of increasing the initial speed of a ball?
- Decreases the range
 - Increases the time in air
 - Increases the range
 - Has no effect

Ans :

FOREIGN 2017

(c) Increases the range
Increasing the initial speed of a ball in projectile motion generally increases its range. A higher initial velocity results in greater horizontal displacement, assuming the launch angle remains optimal. This principle is critical in sports like basketball, soccer, and javelin throw.

- 49.** The optimal launch angle for maximum range in projectile motion, neglecting air resistance, is approximately:
- 30°
 - 45°
 - 60°
 - 90°

Ans :

SQP 2009

(b) 45°
The optimal launch angle for maximum range in projectile motion, when neglecting air resistance, is approximately 45 degrees. At this angle, the horizontal and vertical components of the initial velocity are balanced to maximize distance, an important concept in sports such as shot put and javelin.

Newton's Second Law explains how force causes acceleration. The force applied results in motion, and this net force is often termed the resultant force.

- 74.** Acceleration due to an external force acting on a moving object is technically defined as the change in that object's
- (a) Location
 - (b) Direction
 - (c) Velocity
 - (d) Movement

Ans :

SQP 2012

- (c) Velocity

Acceleration is the rate at which an object's velocity changes due to an applied force. A force acting on a moving object alters its velocity, either increasing or decreasing it.

- 75.** The three basic components of a lever are

- (a) Mass, weight & velocity.
- (b) Force, Fulcrum & Load
- (c) Fulcrum, Resistance & Effort
- (d) Both b and c.

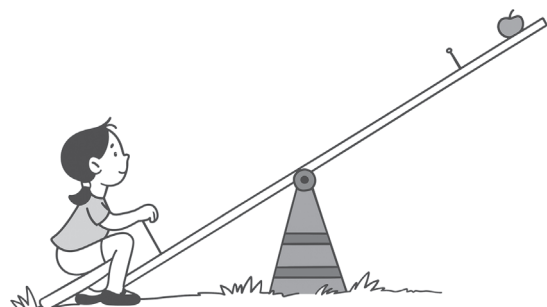
Ans :

COMP 2005

- (d) Both b and c (Force, Fulcrum & Load / Fulcrum, Resistance & Effort)

A lever consists of a fulcrum (pivot point), effort (applied force) and load (resistance). These components determine how the lever functions in movement and lifting.

- 76.** What type of lever is depicted in the picture?



- (a) 1st Class lever
- (b) 2nd Class lever
- (c) 3rd Class lever
- (d) None of the above

Ans :

DELHI 2011

- (a) 1st Class Lever

The image depicts a seesaw, which is a classic

example of a first-class lever. In this type of lever, the fulcrum is positioned between the effort (applied force) and the load (resistance), allowing balanced movement on either side.

- 77.** Push up is an example of which lever?

- (a) Law of Reaction
- (b) Law of Inertia
- (c) Resultant Force
- (d) Law of Effect

Ans :

OD 2013

- (a) Law of Reaction

A push-up demonstrates Newton's Third Law of Motion (Law of Action and Reaction). When a person pushes against the ground, the ground exerts an equal and opposite force, lifting the body upwards. This interaction follows the principle of action and reaction.

- 78.** In the human body, the most common class of lever _____

- (a) 1st Class lever
- (b) 2nd Class lever
- (c) 3rd Class lever
- (d) None of the above

Ans :

FOREIGN 2015

- (c) 3rd Class Lever

Most body movements involve third-class levers, where muscles apply force between the fulcrum (joint) and the load (limb movement), like in bicep curls.

- 79.** When the sum of force acting upon the object and sum of the movement acting upon the body is both equal to zero then the body is said to be in

- (a) Equilibrium
- (b) Static equilibrium
- (c) Dynamic equilibrium
- (d) Zero force

Ans :

SQP 2019

- (a) Equilibrium

Equilibrium occurs when no net force or torque acts on an object, maintaining stability without acceleration or rotational change.

- 80.** The position of the centre of gravity changes depending upon the

- (a) position of force
- (b) position of the body
- (c) position of the intersection of force
- (d) position of stability

92. Match the type of friction in List-I with a relevant sporting example from List-II.

	List-I		List-II
(a)	Static Friction	(i)	A cyclist wearing a streamlined helmet to reduce air resistance.
(b)	Sliding Friction	(ii)	The grip a weightlifter has on a barbell before starting a lift.
(c)	Rolling Friction	(iii)	Skis gliding over the surface of the snow.
(d)	Fluid Friction	(iv)	A cricket ball rolling to a stop on the grass.

Select the correct option from the following:

- (A) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)
 (B) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (C) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
 (D) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

Ans :

FOREIGN 2002

- (C) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Static friction is the force that prevents motion, like the grip on a barbell. Sliding friction occurs when one surface slides over another, like in skiing. Rolling friction occurs when an object rolls, like a cricket ball on grass. Fluid friction opposes motion through a fluid (like air), which is why cyclists use streamlined gear.

93. Match the factor affecting a projectile in List-I with its correct description in List-II.

	List-I		List-II
(a)	Speed of release	(i)	The pitch at which the object is thrown into the air.
(b)	Angle of release	(ii)	How high above the ground an object is when it is thrown.
(c)	Height of release	(iii)	Largely determined by the muscular force applied to the object.
(d)	Spin	(iv)	Helps the projectile maintain its course or can cause it to change direction.

Select the correct option from the following:

- (A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (B) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
 (C) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 (D) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

Ans :

SQP 2010

- (D) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

Speed of release refers to how fast the object is released, determined by muscle force. Angle of release is the pitch or angle of projection. Height of release is how high the object is when released. Spin affects the projectile's flight path due to air pressure differences.

94. Broader the base of support, the greater the _____.

- (a) velocity
 (b) momentum
 (c) stability
 (d) friction

Ans :

COMP 2012

- (c) stability

According to the guiding principles of equilibrium, broadening an athlete's base, such as by spreading the feet, increases their stability.

95. A _____ is a force that opposes the motion between two surfaces that are in touch.

- (a) projectile
 (b) friction
 (c) lever
 (d) torque

Ans :

DELHI 2005

- (b) friction

Friction is a force that opposes motion between two surfaces that are in contact with each other.

96. In the human body, the most common class of lever is the _____ class lever.

- (a) first
 (b) second
 (c) third
 (d) fourth

Ans :

OD 2011

- (c) third

The third-class lever is the most common in the human body because most sports skills prioritize speed and range of motion over force.

Studies suggest that basketball free-throws are most accurate when released at angles between 48.7° and 52.2° , optimizing arc height and entry angle.

89. Match the law or concept from List-I with its corresponding name or description in List-II.

	List-I		List-II
(a)	Newton's First Law	(i)	Law of Reaction
(b)	Newton's Second Law	(ii)	Law of Inertia
(c)	Newton's Third Law	(iii)	Law of Momentum
(d)	A swimming diver pushing off the board	(iv)	Example of Law of Reaction

Select the correct option from the following:

- (A) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
 (B) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
 (C) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (D) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

Ans :

COMP 2003

(B) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
 Newton's First Law is the Law of Inertia. The Second Law is the Law of Momentum, dealing with force and acceleration. The Third Law is the Law of Reaction. A diver pushing on a board and the board pushing back is a clear example of the Law of Reaction.

90. Match the type of lever in List-I with its defining characteristic in List-II.

	List-I		List-II
(a)	First-Class Lever	(i)	The Load (resistance) is between the fulcrum and the effort.
(b)	Second-Class Lever	(ii)	The Effort (force) is between the fulcrum and the load.
(c)	Third-Class Lever	(iii)	The Fulcrum is between the effort and the load.
(d)	Bicep Curl	(iv)	A common example of a third-class lever in the body.

Select the correct option from the following:

- (A) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
 (B) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (C) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
 (D) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

Ans :

DELHI 2008

(D) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

A first-class lever has the fulcrum in the middle. A second-class lever has the load in the middle. A third-class lever has the effort in the middle and is the most common in the human body, with the bicep curl being a prime example.

91. Match the biomechanical concept in List-I with its correct definition in List-II.

	List-I		List-II
(a)	Equilibrium	(i)	The balance of the body during movement.
(b)	Centre of Gravity	(ii)	A state of balance where opposing forces cancel each other out.
(c)	Static Equilibrium	(iii)	The point where the entire weight of a body may be considered to be concentrated.
(d)	Dynamic Equilibrium	(iv)	The balance of the body when it is at rest or completely motionless.

Select the correct option from the following:

- (A) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
 (B) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
 (C) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
 (D) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

Ans :

OD 2006

(A) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
 Equilibrium is a state of balance. Centre of Gravity is the point of concentrated weight. Static equilibrium is balance during rest, while dynamic equilibrium is balance during movement.

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effective force transmission during the push-off phase, enabling rapid acceleration and improved performance on the track.

57. Which application of projectile motion is commonly observed in basketball?

(a) Dribbling
(b) Free throws
(c) Defensive stance
(d) Running speed

Ans :

OD 2001

(b) Free throws

Free throws in basketball exemplify projectile motion, where the ball is launched at an optimal angle and velocity to follow a parabolic path. Understanding this motion aids in predicting the ball's trajectory, helping players achieve consistent shooting accuracy from the free throw line.

58. In weightlifting, Newton's Second Law indicates that increasing the load will:

(a) Increase acceleration
(b) Decrease acceleration
(c) Not affect acceleration
(d) Change direction

Ans :

FOREIGN 2004

(b) Decrease acceleration

Newton's Second Law ($F = ma$) reveals that for a constant force, an increase in load (mass) results in decreased acceleration. In weightlifting, heavier weights are accelerated more slowly, requiring greater force for the same rate of motion, thereby affecting performance outcomes.

59. In racket sports, which lever type is primarily used when swinging a racket?

(a) First-class lever
(b) Second-class lever
(c) Third-class lever
(d) Compound lever

Ans :

SQP 2002

(c) Third-class lever

In racket sports, the arm acts as a third-class lever, where the effort is applied between the fulcrum (shoulder) and the load (racket). This configuration favors speed and range of motion, essential for quick, dynamic swings during competitive play.

60. How does increased friction on a playing surface reduce injury risk?

(a) By decreasing traction
(b) By providing better grip and stability
(c) By increasing slipping
(d) By reducing muscle activation

Ans :

COMP 2006

(b) By providing better grip and stability

Increased friction on playing surfaces provides better grip and stability for athletes. Enhanced traction reduces the risk of slips and falls during rapid movements or directional changes, thereby lowering injury risks and contributing to safer performance conditions in sports.

61. Which factor negatively impacts projectile motion in outdoor sports?

(a) Optimal launch angle
(b) Air resistance
(c) Initial velocity
(d) Gravitational force

Ans :

DELHI 2011

(b) Air resistance

Air resistance negatively impacts projectile motion in outdoor sports by reducing the range and altering the trajectory of moving objects. This drag force slows the object down, affecting distance and accuracy, which athletes must account for in sports like soccer, golf, and javelin.

62. How can biomechanics be used to improve sports performance?

(a) By ignoring motion analysis
(b) Through detailed analysis of movement patterns and forces
(c) By reducing training intensity
(d) By solely focusing on nutrition

Ans :

OD 2013

(b) Through detailed analysis of movement patterns and forces

Biomechanics improves sports performance through the detailed analysis of movement patterns, force distribution, and body mechanics. By understanding these factors, coaches and athletes can optimize techniques, reduce injury risk, and enhance overall efficiency and performance in various sporting disciplines.

63. **Assertion (A) :** Newton's Second Law ($F = ma$) is fundamental in sports, as it explains how greater muscular force increases an athlete's acceleration.

Reason (R) : In sprinting, increasing the force exerted by the muscles directly results in a proportional increase in acceleration.

97. An object in flight after being thrown, influenced only by gravity and air resistance, is called a _____.

(a) lever
(b) fulcrum
(c) projectile
(d) force

Ans :

FOREIGN 2013

(c) projectile

A projectile is defined as any object which, once projected or dropped, continues in motion by its own inertia and is influenced only by the downward force of gravity.

98. Newton's Third Law states that for every action, there is an equal and opposite _____.

(a) reaction
(b) force
(c) inertia
(d) acceleration

Ans :

SQP 2015

(a) reaction

Newton's Third Law is also known as the Law of Reaction. It explicitly states that for every action, there is an equal and opposite reaction.

TWO MARKS QUESTIONS

99. Describe the second class lever with suitable example from sports.

Ans :

2024

A second-class lever is characterized by the positioning of the load or resistance between the fulcrum and the applied force. In this type of lever system, shifting the fulcrum alters both the force arm and the resistance arm, either increasing or decreasing their lengths accordingly. The force arm consistently remains longer than the resistance arm, ensuring that the effort required to lift the resisting weight is always less than the actual weight itself. This mechanical advantage makes second-class levers highly efficient in reducing the effort needed to move heavy loads while maintaining control and stability.

100. Mention any two types of friction by giving suitable examples from sports.

Ans :

2024

Friction is described as the opposing force that resists the motion between two surfaces in contact. It can be classified into Static Friction and Kinetic Friction. Static friction acts before an object begins to move, preventing initial motion, whereas Kinetic friction comes into play once the object is already sliding or rolling. Kinetic friction is further categorized into sliding friction, which occurs when an object moves across a surface, and rolling friction, which takes place when an object rolls over a surface. Each type of friction plays a crucial role in influencing movement and resistance in various physical interactions.

101. Mechanical analysis of Javelin thrown by Neeraj What do you mean by 'Kinesiology'?

Ans :

COMP 2018

Kinesiology is a branch of physiology that focuses on the physiological processes and anatomy of the human body in relation to movement. It is a scientific discipline that explores the interrelationship between physiological functions and anatomical structures concerning human motion.

102. Which field of study in sports is called 'Biomechanics'?

Ans :

DELHI 2018

Biomechanics is the field of study in sports that applies the principles of physics and mechanics to analyze human movement. It examines how forces act on the body, how athletes generate motion, and how efficiency, performance, and injury prevention can be improved.

103. "When a cricket ball is moving with a certain velocity, the player has to apply retarding force to bring the ball at rest in his hands." Which Newton's Law is applied in this illustration?

Ans :

OD 2023

A cricket player follows this technique to increase the time over which the high velocity of the moving ball gradually decreases to zero. By extending the catching motion, the acceleration of the ball is reduced, thereby minimizing the impact force experienced by the hands. This principle directly applies Newton's Second Law, which states that the rate of change of acceleration of an object is directly proportional to the force applied and inversely proportional to its mass. By increasing the time of deceleration, the force exerted on the hands is significantly reduced, making the catch safer and more controlled.

between the fulcrum and the load.

Example: In a baseball swing, the elbow serves as the fulcrum while the force from the shoulder (effort) is applied to move the bat (load).

Each lever type allows athletes to maximize efficiency and force production in various sports activities.

- 128.** Define static and dynamic equilibrium. How does the concept of center of gravity play a role in maintaining equilibrium during sports?

Ans :

OD 2018

1. **Static Equilibrium :** When an object remains at rest and all forces are balanced.
Example: A gymnast holding a handstand maintains static equilibrium by aligning their center of gravity over their base of support.
2. **Dynamic Equilibrium :** When an object is in motion but still maintains a balanced state, despite changing conditions.
Example: A surfer riding a wave adjusts their body position continuously to maintain dynamic equilibrium.
3. **Center of Gravity :** The point at which an object's mass is concentrated; its proper alignment is critical for balance.
In sports, athletes often lower their center of gravity or shift it strategically to enhance stability and performance—for example, a sprinter leaning forward at the start to maximize force without losing balance.

- 129.** (a) Explain how friction affects performance in sports.
(b) Provide two examples of how athletes or equipment are designed to manage friction.

Ans :

FOREIGN 2013

- (a) **Effect of Friction :** Friction is the force resisting the relative motion of surfaces. In sports, it can both aid performance (by providing grip and stability) and hinder it (by causing energy loss or wear).
- (b) **Examples:**
 - i. **Athlete Footwear :** Shoes with specific tread patterns enhance grip on playing surfaces, preventing slips during rapid movements.
 - ii. **Sports Equipment :** In skiing, wax is applied to skis to control the level of friction between the skis and the snow, optimizing speed and maneuverability.

These adaptations ensure that friction is

managed to support performance rather than detract from it.

- 130.** Discuss the basic principles of projectile motion in sports. How do factors like angle, initial velocity, and gravity influence the trajectory of a projectile?

Ans :

SQP 2017

Projectile motion in sports involves objects that are thrown, kicked, or hit and then move under the influence of gravity.

1. **Angle :** The launch angle determines the height and range of the projectile. An optimal angle (often around 45° in ideal conditions) maximizes horizontal distance.
2. **Initial Velocity :** A higher initial speed increases both the range and the maximum height reached by the projectile.
3. **Gravity:** Gravity continuously accelerates the projectile downward, shaping its parabolic trajectory.

Together, these factors determine where and how a ball, javelin, or any sports implement will land, crucial for strategic play and technique in sports like basketball, soccer, and track and field events.

- 131.** (a) How can knowledge of levers and equilibrium improve an athlete's technique in sports such as weightlifting or gymnastics?
(b) Provide an example where adjusting the center of gravity enhances performance.

Ans :

COMP 2001

- (a) **Improving Technique :** Understanding levers allows athletes to optimize force application and reduce energy wastage. In weightlifting, for instance, proper body positioning can leverage the barbell more efficiently. Knowledge of equilibrium ensures that athletes maintain balance during complex movements, reducing the risk of falls or improper loading.
- (b) **Example – Gymnastics:**
When performing a balance beam routine, a gymnast shifts her center of gravity by extending or retracting her limbs. This adjustment enables her to maintain stability despite the narrow support base, thus enhancing performance and reducing the likelihood of falls.
By integrating biomechanics principles, athletes can refine techniques for maximum efficiency and safety.

- 110.** Explain the concept of levers and describe how a second-class lever can enhance performance in sports like cycling.

Ans :

COMP 2009

1. Concept: A lever is a rigid structure that pivots around a fixed point (fulcrum) to amplify force.
2. Second-Class Lever in Cycling: In a bicycle, the pedals act as the point where force is applied, and the bicycle's wheel serves as the fulcrum. The rider's force on the pedal lifts the chain and rotates the wheel, effectively magnifying the input force to propel the bike forward. This setup allows cyclists to convert relatively modest leg strength into significant forward momentum.

- 111.** How does the center of gravity influence balance in sports, and what strategies do athletes use to control it?

Ans :

DELHI 2001

1. Influence: The center of gravity is the point where the total weight of the body is considered to be concentrated. Its position relative to the base of support determines balance and stability.
2. Strategies: Athletes adjust their body posture—for example, by bending knees or leaning their torso—to shift the center of gravity as needed. In sports like gymnastics or surfing, maintaining a low center of gravity helps achieve greater stability and control during complex maneuvers, enabling athletes to react quickly to changes in direction or external forces.

- 112.** Analyze the role of friction in sports equipment design, particularly for shoes and playing surfaces.

Ans :

OD 2004

1. Role in Equipment Design: Designers optimize the material and tread patterns of shoes to create an ideal balance between grip and ease of movement. For instance, running shoes feature soles that provide sufficient traction to prevent slipping on track surfaces while minimizing friction to allow for efficient forward movement.
2. Playing Surfaces: The texture and composition of surfaces—such as synthetic turf, hardwood floors, or ice—are engineered to offer the correct amount of friction. This optimization

enhances performance by reducing energy loss during movement while also minimizing injury risks associated with sudden slips or stops.

- 113.** Describe the key variables in projectile motion and their importance in determining the outcome of a basketball shot.

Ans :

FOREIGN 2007

1. Key Variables:
 - i. Initial Velocity: The speed at which the ball is released.
 - ii. Launch Angle: The angle relative to the horizontal at which the ball is thrown.
 - iii. Gravity: The constant force that pulls the ball downward, influencing the parabolic trajectory.
2. Importance : In basketball, the combination of the ball's initial velocity and launch angle determines its arc and likelihood of entering the basket. An optimal trajectory minimizes the chance of the ball bouncing off the rim and maximizes scoring efficiency. Coaches and players often analyze these variables to refine shooting techniques for improved accuracy.

- 114.** How can Newton's Laws of Motion be integrated into training programs to improve an athlete's performance?

Ans :

SQP 2003

1. Integration: Coaches use Newton's laws to design drills that enhance acceleration (Second Law) and optimize movement efficiency. For instance, plyometric exercises leverage the action-reaction principle (Third Law) to develop explosive power, while balance drills incorporate the concept of inertia (First Law) to improve stability during rapid changes in direction.
2. Outcome: These training strategies help athletes develop better strength, agility, and overall performance by aligning movement mechanics with fundamental physics principles.

- 115.** Explain how lever systems in the human body contribute to force generation in activities like throwing a baseball.

Ans :

COMP 2008

1. Lever Systems: The human body employs a series of lever systems where bones act as levers and joints serve as fulcrums.

- 145.** (a) State Newton's Third Law of Motion (Law of Reaction).
 (b) Explain its application in swimming and in performing a vertical jump.

Ans :

SQP 2019

- (a) Newton's Third Law of Motion states that for every action, there is an equal and opposite reaction. This means that whenever one object exerts a force on a second object, the second object exerts an equal and opposite force back on the first.
- (b) This law is fundamental to movement in many sports.
- In swimming, a swimmer propels themselves forward by pushing water backward with their hands and feet. The water, in turn, pushes the swimmer forward with an equal and opposite force. This "action" of pushing water back creates the "reaction" of forward motion.
 - When performing a vertical jump, an athlete applies a strong downward force on the ground with their legs (the action). The ground exerts an equal and opposite force upward on the athlete (the reaction). It is this ground reaction force that propels the athlete into the air.
- 146.** (a) What are the four components of any lever system?
 (b) Describe a first-class lever and provide an example of its use in the human body, such as throwing a ball.

Ans :

COMP 2014

- (a) All lever systems are made up of four essential components:
- The Lever: The rigid bar that turns, which in the body is a bone.
 - The Fulcrum: The pivot point around which the lever rotates, which is a joint in the body.
 - The Effort: The muscular force applied to move the lever.
 - The Load: The resistance or object that needs to be moved.
- (b) A first-class lever is one where the fulcrum is positioned between the effort and the load. An example in the human body occurs when throwing a ball, specifically during the extension of the elbow. In this movement, the elbow joint acts as the fulcrum. The effort is

provided by the triceps muscle contracting, and the load is the weight of the forearm, hand, and the ball itself being moved.

- 147.** (a) What is the relationship between the angle of release and the distance a projectile travels?
 (b) Explain how the optimal angle of release might differ between an event like the long jump and shooting a basketball.

Ans :

DELHI 2016

- (a) The angle of release refers to the angle at which a projectile is thrown or hit into the air. This angle has a direct relationship with the horizontal distance the projectile will travel. For any given speed and height of release, an angle of 45 degrees will theoretically produce the maximum possible horizontal distance. Angles higher or lower than 45 degrees will result in a shorter distance.
- (b) The optimal angle of release varies depending on the specific goal of the activity.
- In the long jump, where the primary goal is to maximize horizontal distance, athletes aim for an angle of release as close to 45 degrees as possible to achieve the greatest distance.
 - In shooting a basketball, the goal is not maximum distance but rather clearing a defender and having the ball enter the hoop from above. Therefore, a much higher angle, often greater than 45 degrees, is required to create a steep arc that allows the ball to drop down into the basket.

- 148.** Explain Newton's three Laws of Motion and provide one example of how each law is applied in sports.

Ans :

OD 2020

- First Law (Law of Inertia):** An object at rest stays at rest and an object in motion continues in motion with the same speed and direction unless acted upon by an external force.
 Example in Sports: A soccer ball will remain still until a player kicks it, and once in motion, it will continue moving until friction from the grass and air resistance slow it down.
- Second Law ($F=ma$):** The acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass.

one—can alter the bounce and roll of the ball. For example, on a slick surface, the ball might skid, reducing accuracy, whereas a rougher surface may provide more predictable behavior. Adjusting for these variations is essential for performance and strategic planning.

- 122.** Define biomechanics and explain its significance in improving sports performance. How do principles of physics integrate with human movement?

Ans :

DELHI 2013

Biomechanics is the study of the mechanical principles of living organisms, particularly how muscles, bones, and joints work together to produce movement. Its significance in sports lies in optimizing performance by analyzing and improving movement patterns. By applying principles of physics—such as force, torque, and energy transfer—coaches and athletes can fine-tune techniques to maximize efficiency, power, and reduce injury risk.

- 123.** Discuss how changes in the center of gravity can affect an athlete's balance and performance in sports such as skiing or cycling.

Ans :

OD 2015

The center of gravity is the point where an athlete's mass is concentrated. In skiing, a lower center of gravity helps maintain balance on uneven terrain and allows for quicker turns. In cycling, keeping the center of gravity low and centered improves stability and control, especially during sprints or cornering. Adjustments in body position to optimize the center of gravity are essential for maintaining balance and enhancing performance under dynamic conditions.

- 124.** How does friction influence energy loss in sports equipment? Provide an example involving a common sport where friction is managed to improve performance.

Ans :

FOREIGN 2019

Friction between moving parts of sports equipment and the playing surface can result in energy loss, reducing overall performance. For example, in cycling, minimizing friction in the chain and gears through lubrication and using aerodynamic components reduces resistance, allowing more of the cyclist's energy to be used for propulsion. Managing friction in this way is crucial for achieving higher speeds and improved efficiency.

- 125.** Describe the factors that determine the optimal angle and initial velocity in projectile sports, such as javelin throw. How do these factors interact to maximize distance?

Ans :

SQP 2014

The optimal angle for a projectile in sports like javelin throw is determined by the interplay of initial velocity and gravitational pull. A launch angle close to 45° is often ideal in theory; however, in practice, adjustments are made based on the athlete's ability to generate speed (initial velocity) and air resistance. A higher initial velocity increases both the height and distance of the projectile, while the optimal angle ensures that the energy is distributed efficiently between vertical and horizontal motion, maximizing range.

- 126.** Explain how static equilibrium is critical for athletes in sports that require holding a pose or position, such as gymnastics or archery.

Ans :

COMP 2016

Static equilibrium is crucial when an athlete must maintain a fixed posture. In gymnastics, holding a handstand or balance beam routine demands that the center of gravity be perfectly aligned with the base of support. In archery, maintaining a stable stance minimizes movement, ensuring accuracy. Both sports require that all forces acting on the body balance out so that the athlete remains motionless despite external disturbances, contributing to precision and performance.

THREE MARKS QUESTIONS

- 127.** Describe the different types of levers found in the human body. Give an example of a sports movement that utilizes each type of lever.

Ans :

DELHI 2020

- 1. First-Class Lever :** The fulcrum is between the effort and the load.
Example: In gymnastics, when performing a neck bridge, the head acts as the fulcrum.
- 2. Second-Class Lever :** The load is between the fulcrum and the effort.
Example: In calf raises during running, the ball of the foot acts as the fulcrum, with the body weight as the load.
- 3. Third-Class Lever :** The effort is applied

- 104.** How does Newton's Second Law apply to the acceleration of an athlete during a sprint?

Ans :

FOREIGN 2019

Newton's Second Law ($F=ma$) states that the acceleration of an object is proportional to the net force acting upon it and inversely proportional to its mass.

Application: A sprinter accelerates by exerting a strong force against the track through powerful leg muscles. The greater the force relative to the athlete's mass, the higher the acceleration. Coaches may focus on strength training to increase the force output, thereby improving sprinting speed.

- 105.** Provide examples of how first, second, and third-class levers are used in common sporting movements or equipment.

Ans :

SQP 2014

1. First-Class Lever Example: In martial arts, a karate chop involves the head of the arm (fulcrum) between the hand applying force and the target, allowing for effective transfer of energy.
2. Second-Class Lever Example: In weightlifting, performing a calf raise uses the ball of the foot as the fulcrum, with the body weight acting as the load, enabling the muscles to lift the weight more efficiently.
3. Third-Class Lever Example: In tennis, a racket swing involves the wrist as the fulcrum, where the effort applied by the forearm muscles maximizes the speed of the racket head to hit the ball.

- 106.** What is dynamic equilibrium, and how do athletes use changes in their center of gravity to maintain it during rapid movements?

Ans :

COMP 2016

1. Dynamic Equilibrium: This occurs when an individual maintains balance while in motion.
2. Application in Sports: Athletes continuously adjust their body posture and shift their center of gravity during rapid movements such as running, jumping, or changing directions. For instance, a basketball player making a sudden change in direction lowers their center of gravity by bending their knees, enhancing stability and reducing the risk of falling.

- 107.** How does friction affect performance in sports that take place on different surfaces (e.g., ice vs. grass)?

Ans :

DELHI 2018

1. On Ice: Low friction allows for smooth, gliding movements essential in sports like ice hockey or figure skating. However, too little friction can lead to difficulty in starting and stopping or executing tight maneuvers.
2. On Grass: Higher friction provides better grip for sports such as soccer and rugby, enabling players to accelerate quickly and change direction. Conversely, excessive friction or an overly rough surface can increase injury risk by causing slips or uneven footing.
3. Overall: The design of sports surfaces and footwear is optimized to provide the ideal friction level for performance and safety.

- 108.** Describe how the principles of projectile motion are applied in the sport of javelin throw.

Ans :

OD 2020

1. Principles: Projectile motion involves the initial launch angle, velocity, and the influence of gravity, determining the arc and distance traveled by the javelin.
2. Application in Javelin Throw: Athletes must find the optimal angle (usually around $30-40^\circ$) and apply sufficient force to maximize the horizontal distance. The spin and aerodynamics of the javelin also play a role, as they stabilize its flight path, allowing for a more predictable trajectory and improved performance.

- 109.** Discuss how Newton's Third Law is essential in sports where impact and reaction forces are critical, such as in boxing.

Ans :

SQP 2017

Newton's Third Law states that every action has an equal and opposite reaction.

Application in Boxing: When a boxer punches, the force applied to the opponent is matched by an equal force acting on the puncher's arm. This principle explains why proper technique, including transferring body weight and using momentum, is crucial to maximize impact while minimizing injury risk. It also emphasizes the need for strong core and stabilizing muscles to counteract the reaction force during a punch.

- 132.** (a) Describe the role of friction in sports performance. How can both high and low friction environments affect athletes?
- (b) Provide specific examples of sports where friction is either beneficial or detrimental.

Ans :

DELHI 2009

- (a) Role of Friction : Friction is the resistance to motion between surfaces. High friction can improve grip and control, while low friction can reduce resistance and facilitate smooth movement.
- (b) Examples:
- Beneficial: In basketball, high friction between shoes and the court surface helps players change directions quickly without slipping.
 - Detrimental: In ice skating, low friction is desired for smooth gliding; however, too little friction on a rough surface can lead to falls.

Thus, managing friction is essential to optimize performance and safety across different sports environments.

- 133.** Explain the basic physics of projectile motion. How do angle of release and initial velocity determine the distance traveled by a ball in sports such as football or cricket?

Ans :

OD 2004

Projectile motion is governed by the interplay of initial velocity, angle of release, and gravity.

- Angle of Release : Determines the trajectory; an optimal angle (around 45° in a vacuum) maximizes horizontal distance.
- Initial Velocity : The greater the speed at launch, the further the projectile travels.

In sports like football or cricket, a well-struck ball with the right combination of angle and speed will travel farther, illustrating the practical application of projectile physics in optimizing performance.

- 134.** (a) How can knowledge of biomechanical principles like levers and equilibrium enhance an athlete's technique in sports?
- (b) Describe a scenario in a sport where adjusting the center of gravity or leveraging mechanical advantage can prevent injury and improve performance.

Ans :

FOREIGN 2002

- (a) Enhancing Technique : Understanding levers helps athletes maximize force and efficiency in movements—knowing where to place the fulcrum can reduce energy expenditure and increase power. Equilibrium principles enable athletes to maintain balance during complex motions, reducing the risk of falls or injury.
- (b) Practical Scenario : In weightlifting, an athlete who adjusts their body position to lower their center of gravity when lifting a heavy weight can achieve a more stable posture, decreasing the likelihood of injury and enhancing lift performance. Similarly, in gymnastics, carefully shifting the center of gravity during a dismount ensures that the landing is controlled and safe, highlighting the role of biomechanical adjustments in preventing injuries and improving performance.

- 135.** Outline how Newton's Laws of Motion influence the design of sports equipment, such as running shoes and tennis rackets.

Ans :

SQP 2006

- Newton's First Law : Sports equipment is designed to overcome inertia. For example, running shoes incorporate cushioning materials to help absorb shock when a runner decelerates, reducing injury risk.
- Newton's Second Law : Materials and design elements in tennis rackets are optimized so that a light yet strong frame allows players to generate high acceleration, translating force into a powerful swing.
- Newton's Third Law : The interaction between the ball and a racket or the foot and ground is designed to maximize the reaction force, enhancing performance.

These principles ensure that equipment not only supports athletic performance but also minimizes the risk of injury through efficient energy transfer.

- 136.** (a) How do athletes use their understanding of projectile motion to optimize performance in sports such as javelin throw or long jump?
- (b) What role does the optimal release angle play in achieving maximum distance?

Ans :

COMP 2008

- (a) Application in Sports : Athletes in javelin throw or long jump use projectile motion principles by focusing on achieving the highest possible initial velocity combined

with an optimal launch angle. They work on technique to generate speed and ensure that the angle of release maximizes horizontal distance.

- (b) Optimal Release Angle : Theoretically, a 45° angle maximizes range in a vacuum; however, in real-life conditions, slight adjustments are made based on the athlete's speed and environmental factors. Maintaining an optimal angle ensures that the projectile covers the greatest distance possible by balancing vertical lift and horizontal force.

- 137.** (a) How can biomechanical analysis help in preventing injuries during high-impact sports?
(b) Provide an example of a training modification based on biomechanical principles that can reduce the risk of injury.

Ans :

DELHI 2003

- (a) Preventing Injuries Through Analysis : Biomechanical analysis helps identify inefficient or risky movement patterns that increase the likelihood of injury. By examining forces, angles, and lever systems in an athlete's movement, coaches can correct techniques to reduce strain on muscles and joints.
(b) Example – Training Modification:
For instance, if analysis reveals that a basketball player's landing mechanics from jumps cause excessive stress on the knees, a training program can be implemented focusing on proper landing techniques, such as bending the knees more deeply to absorb impact. This modification reduces joint stress and lowers the risk of injuries like sprains or fractures.

- 138.** (a) Explain the role of levers in the biomechanics of a baseball swing.
(b) How does the lever system help in maximizing the speed of the bat and the force applied to the ball?

Ans :

OD 2007

- (a) Role of Levers : In a baseball swing, the arm acts as a lever system—specifically a third-class lever—where the shoulder is the fulcrum, the effort is applied by the muscles in the mid-arm, and the bat represents the load.

- (b) Maximizing Speed and Force : This lever arrangement allows for rapid acceleration of the bat; the muscle-generated force is amplified through the lever action, resulting in higher bat speed. Consequently, the increased speed at impact translates into greater force applied to the ball, leading to more powerful hits.

139.

- (a) How does understanding biomechanics assist coaches in developing better training programs for athletes?
(b) Provide an example where biomechanical feedback led to a measurable improvement in an athlete's performance or injury prevention.

Ans :

FOREIGN 2010

- (a) Assisting in Training Programs: Understanding biomechanics enables coaches to analyze an athlete's movement patterns, identify inefficiencies, and tailor training programs that correct poor form, enhance force production, and minimize injury risk. This scientific approach to training helps maximize performance while ensuring longevity in sports.
(b) Example : A sprinter's performance was improved after biomechanical analysis revealed that excessive forward lean was causing energy wastage and instability at the start. By incorporating drills that focused on maintaining an optimal posture and adjusting the lean, the sprinter achieved a more explosive start and reduced the risk of hamstring strains. This modification illustrates how biomechanical feedback can lead to tangible performance improvements and better injury prevention.

- 140.** Explain Newton's First Law of Motion (Law of Inertia) and provide two examples of its application in sports.

Ans :

SQP 2012

Newton's First Law of Motion, also known as the Law of Inertia, states that a body will remain at rest or continue to move at a constant velocity unless acted upon by an external force. Inertia is the resistance of any object to a change in its state of motion.

Two examples in sports are:

1. A soccer ball placed for a penalty kick will remain at rest until the player applies a force by kicking it. Similarly, the kicked ball would

continue in motion indefinitely if not for the external forces of air resistance and gravity stopping it.

2. A skater gliding on ice will continue moving at a constant speed and direction until an external force—like friction from the ice or the push from the skater's leg—acts upon them to slow them down or change their direction.

- 141.** What is a third-class lever? Explain why it is the most common lever in the human body, providing a specific sporting example.

Ans :

COMP 2005

A third-class lever is a lever system where the force (effort) is applied between the fulcrum and the resistance (load). In this type of lever, the force arm is always shorter than the resistance arm. This arrangement means a large amount of force is required, but it provides a significant gain in the speed and range of motion at the resistance end.

This class of lever is the most common in the human body because most sports skills prioritize speed and range of motion over force. For example, when performing a bicep curl or throwing a ball, the elbow joint acts as the fulcrum, the bicep muscle provides the effort just below the elbow, and the load is the weight in the hand. This allows the hand to move through a wide range of motion very quickly.

- 142.** Define 'Centre of Gravity' (COG). Explain how an athlete can lower their COG to increase stability, giving an example from a sport like wrestling or basketball.

Ans :

DELHI 2011

The Centre of Gravity (COG) is the theoretical point at which the entire weight or mass of a body may be considered to be concentrated. In humans, the COG is not fixed; it shifts with every change in body posture.

One of the guiding principles of stability is that the lower the centre of gravity, the higher the stability. An athlete can lower their COG by bending their knees and widening their stance. This action brings their mass closer to their base of support, making them more stable and harder to move. For example, in wrestling, a wrestler often adopts a low crouch or half-sitting position to maintain balance and resist being taken down

by an opponent. Similarly, a basketball player on defense will bend their knees and widen their stance to quickly react to an opponent's movements without losing balance.

- 143.** What is a projectile in the context of sports? List four factors that affect the trajectory of a projectile.

Ans :

OD 2013

In sports, a projectile is any object that, once thrown or struck, continues in motion influenced only by the downward force of gravity and air resistance. The path a projectile follows is known as its trajectory, which is typically parabolic. Examples in sports include a basketball, a shot-put, a javelin, or even the human body itself during a long jump or a dive.

Four factors that affect a projectile's trajectory are:

1. Speed of release: How fast the object is thrown or hit.
2. Angle of release: The angle at which the object is projected into the air.
3. Height of release: How high above the ground the object is when released.
4. Spin: Rotation applied to the object, which can cause it to change direction or height.

- 144.** Discuss the advantages and disadvantages of friction in sports, using specific examples to illustrate both aspects.

Ans :

FOREIGN 2015

Friction is a necessary force in sports but can also be a hindrance.

1. Advantages: Friction is essential for grip and movement. For example, the spikes on an athlete's shoes increase friction, allowing them to generate force against the ground for running and preventing slips. In gymnastics, a gymnast uses lime powder to increase friction between their hands and the horizontal bar, ensuring a secure grip.
2. Disadvantages: Friction can oppose motion and cause wear and tear. In cycling, friction between the tires and the track, as well as air resistance (fluid friction), heats the tires and requires the cyclist to expend more energy to maintain speed. In sports like weightlifting or gymnastics, friction can damage the skin on the palms. It also causes sporting equipment to wear out over time.

2. Baseball Throwing: During a throw, the shoulder acts as a fulcrum, the muscles provide the effort, and the arm segments (forearm and hand) transmit force to the ball. This arrangement allows for the efficient transfer of energy from the body to the ball, resulting in high-velocity throws.
3. Significance: Understanding these mechanics helps in optimizing throwing techniques and reducing the risk of overuse injuries.

116. In what ways does the center of gravity play a role in the execution of a high jump, and how do athletes adjust it for maximum efficiency?

Ans :

DELHI 2006

1. Role in High Jump: In high jump, athletes must manage their center of gravity to clear the bar without dislodging it.
2. Adjustment Techniques: Jumpers use techniques such as the Fosbury Flop, where they arch their back and roll over the bar so that the center of gravity passes below the bar while their body clears it. This method minimizes the energy required and allows for a higher jump.
3. Outcome: Effective manipulation of the center of gravity is crucial for maximizing jump height and ensuring a successful attempt.

117. Discuss how friction can be both an ally and an adversary in sports like skiing, and what measures are taken to optimize its effects.

Ans :

OD 2002

1. Friction as an Ally : In skiing, controlled friction between the skis and the snow allows athletes to maneuver, slow down, and maintain balance on steep slopes.
2. Friction as an Adversary: Excessive friction, however, can slow a skier down, reducing speed and performance.
3. Optimization Measures: Ski waxes and ski designs are developed to balance friction levels—reducing drag while maintaining enough grip for safety and control. This careful tuning maximizes speed and stability during descent.

118. How does an understanding of projectile motion help coaches and athletes improve performance in sports that involve ball trajectories?

Ans :

FOREIGN 2010

1. Understanding Variables : Knowledge of projectile motion allows coaches and athletes to analyze key factors—such as launch angle, velocity, and spin—that determine a ball's trajectory.
2. Practical Application : In sports like soccer, basketball, or volleyball, adjusting these variables can improve accuracy and distance. For example, a basketball coach might work with a player to perfect the angle and force of a shot to increase scoring percentage.
3. Outcome : This scientific approach to refining technique leads to more consistent and effective performance on the field or court.

119. Explain Newton's Third Law of Motion. How does the action-reaction principle manifest in the movement of a swimmer during a race?

Ans :

SQP 2012

Newton's Third Law states that for every action, there is an equal and opposite reaction. In swimming, when a swimmer pushes water backwards with their arms and legs, an equal and opposite force propels them forward. This reaction force is essential for generating forward momentum and speed in the water, enabling effective propulsion during a race.

120. Discuss how the concept of dynamic equilibrium is utilized in sports that require rapid directional changes, such as soccer or basketball.

Ans :

COMP 2005

Dynamic equilibrium in sports is achieved by continuously adjusting the body's center of gravity during movement. In soccer or basketball, athletes rapidly shift their weight to maintain balance while changing direction or evading opponents. This continuous adjustment allows them to remain stable despite sudden acceleration, deceleration, or directional shifts, ultimately enhancing performance and reducing injury risk.

121. Describe the influence of friction on the trajectory of a projectile in sports. How might variations in surface texture alter performance outcomes?

Ans :

OD 2011

Friction can affect both the motion of a projectile and the athlete's interaction with the playing surface. For a projectile (such as a ball), air friction (drag) slightly reduces speed and alters trajectory over long distances. In sports, variations in surface texture—like a wet field versus a dry

Example in Sports: In sprinting, the force a sprinter applies to the ground determines the acceleration; a heavier athlete might need to exert more force to achieve the same acceleration as a lighter athlete.

3. Third Law (Action-Reaction): For every action, there is an equal and opposite reaction. Example in Sports: When a basketball player jumps, they push down on the floor; the floor pushes back with equal force, propelling the player upward.

- 149.** Discuss the role of friction in sports performance and give two examples where friction is beneficial and two where it is a hindrance.

Ans :

SQP 2018

1. Beneficial Friction:
 - i. Example 1: In track running, the friction between the athlete's shoes and the track surface provides the necessary grip to propel forward without slipping.
 - ii. Example 2: In soccer, friction between the ball and the playing field helps in controlling dribbling and ball direction.
2. Hindering Friction:
 - i. Example 1: In ice skating, excessive friction from poorly maintained ice can slow down movement and increase the risk of falls.
 - ii. Example 2: In cycling, friction in the mechanical components of a bicycle (e.g., brakes and chain) can reduce efficiency and speed if not properly lubricated.
3. Overall Impact: The right amount of friction is crucial; too little or too much can negatively affect performance, so equipment and surfaces are often engineered to optimize friction levels for specific sports.

FIVE MARKS QUESTIONS

- 150.** With the help of suitable examples, discuss the application of Newton's laws of motion in sports.

Ans :

2023-24

1. Newton's First Law of Motion (Law of Inertia) : This law states that an object will remain at rest or continue moving at a constant velocity unless influenced by an external force. Inertia refers to an object's tendency

to resist changes in motion, maintaining its speed and direction unless acted upon by an outside force.

Application in Sports:

- i. A skater gliding on ice will continue moving at the same speed and in the same direction unless an external force, such as friction or another player, affects them.
 - ii. When a ball is thrown into the air, the only force acting upon it is gravity. If gravity were absent, the ball would continue traveling in the same direction indefinitely. If thrown upwards without gravitational force, it would continue into space without stopping.
2. Newton's Second Law of Motion (Law of Acceleration) : This law states that the rate of change of momentum of an object is directly proportional to the applied force and occurs in the same direction as the force. The acceleration of an object depends on both the force exerted and its mass—greater force results in greater acceleration, while a heavier object requires more force to move.

Application in Sports:

- i. In shot put, an athlete who applies more force and releases the shot at the optimal angle achieves a greater distance, while an athlete who exerts less force results in a shorter throw.
 - ii. In soccer, a player must apply more force to kick the ball higher and faster. Understanding this principle helps players accurately determine the amount of force needed to pass the ball or score a goal.
3. Newton's Third Law of Motion (Law of Action and Reaction) : This law states that for every action, there is an equal and opposite reaction. When one object applies a force to another, the second object exerts an equal force in the opposite direction. The reaction force always has the same magnitude but acts in the opposite direction.

Application in Sports:

- i. In swimming, a swimmer pushes the water backward with their arms and legs, and in return, the water exerts an equal and opposite force that propels them forward.
- ii. In diving, when an athlete jumps off a springboard, they push downward, and the board applies an equal force upwards,

change direction without a force.

- i. Example 1 (Starting Motion): A soccer ball placed on the penalty spot will remain at rest due to inertia. It only moves when a player applies an external force by kicking it.
 - ii. Example 2 (Continuing Motion): A hockey puck sliding on ice will continue to glide in a straight line at a constant speed until it is slowed down by the external force of friction or stopped by another force like a player's stick or the goalpost.
2. Newton's Third Law (Law of Reaction) states that for every action, there is an equal and opposite reaction. This means whenever one object exerts a force on a second object, the second object exerts an equal and opposite force back on the first.
- i. Example 1 (Jumping): To perform a vertical jump, an athlete's legs apply a strong downward force to the ground (the action). The ground then applies an equal and opposite upward force (the ground reaction force) that propels the athlete into the air.
 - ii. Example 2 (Swimming): A swimmer moves forward by pushing water backward with their arms and legs. This action of pushing the water back results in an equal and opposite reaction force from the water, which pushes the swimmer forward.

- 159.** Define what a lever is in biomechanics and describe the characteristics of a second-class and third-class lever. Provide a clear sporting example for each type, explaining the location of the fulcrum, effort, and load.

Ans :

DELHI 2012

In biomechanics, a lever is a rigid bar, such as a bone, that is used to overcome resistance when a force is applied. It works around a pivot point called a fulcrum (a joint). The human body's system of bones and joints acts as a series of levers to produce movement, with muscles providing the necessary force (effort) to move a resistance (load).

1. Second-Class Lever : In a second-class lever, the load (resistance) is positioned between the fulcrum and the effort (force). This arrangement ensures that the force arm is always longer than the resistance arm,

meaning less force is required to move the load. However, this comes at the expense of range of motion and speed.

Sporting Example (Plantar Flexion/Calf Raise): When an athlete stands on their toes, the body acts as a second-class lever.

- i. Fulcrum: The ball of the foot.
 - ii. Load: The athlete's body weight, acting down through the ankle.
 - iii. Effort: The contraction of the gastrocnemius (calf) muscle, pulling up on the heel.
2. Third-Class Lever : In a third-class lever, the effort (force) is applied between the fulcrum and the load (resistance). In this setup, the force arm is always shorter than the resistance arm. This means a large amount of muscular force is required, but it results in a greater speed and range of motion at the point where the load is. This is the most common type of lever in the human body, as sports skills often prioritize speed over force.
- Sporting Example (Bicep Curl): When lifting a weight with a bicep curl.
- i. Fulcrum: The elbow joint.
 - ii. Effort: The bicep muscle contracting and pulling on the forearm.
 - iii. Load: The weight held in the hand.

- 160.** What is equilibrium? Explain the guiding principles that determine an athlete's degree of stability, using relevant sporting examples for each principle.

Ans :

OD 2006

Equilibrium is defined as a state of balance or a stable situation where all opposing forces acting on a body cancel each other out, resulting in no change in motion. It is essential for performing almost all sports skills. The degree of an athlete's stability, or their ability to resist being upset or toppled, is determined by several key principles:

1. Broader Base of Support: The wider the base, the greater the stability. An athlete can increase their base by spreading their feet apart. For example, a wrestler widens their stance to make it harder for an opponent to move them.
2. Lower Centre of Gravity (COG): The lower an object's COG, the more stable it is. Athletes often lower their COG by bending their knees and hips. A shot-put thrower bends their knees after a throw to maintain balance and avoid fouling, and a defensive

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a lower angle between 3 to 15 degrees is more effective.

4. Height of Release:
 - i. The height from which an object is launched influences how far it will travel.
 - ii. A higher release point increases the horizontal distance covered by the projectile.
 - iii. In sports like javelin or hammer throw, a greater height of release allows the projectile to achieve maximum distance.
5. Spin:
 - i. When a projectile moves through the air, it experiences a spin due to differences in air pressure.
 - ii. The spin helps control the projectile's movement and can influence its height or direction.
 - iii. For example, in basketball shooting, applying spin to the ball helps in maintaining its trajectory and increasing accuracy.
6. Air Resistance:
 - i. As a projectile moves through the air, it encounters resistance that slows it down.
 - ii. Air resistance primarily affects the horizontal component of the projectile's motion, reducing the overall distance covered.
 - iii. Factors such as the surface texture, volume, mass, and speed of the projectile determine how much air resistance it faces.

- 153.** Discuss Newton's Laws of Motion and their application in sports.

Ans :

COMP 2013

Newton's Laws of Motion form the foundation for understanding movement in sports. The three laws—namely, the law of inertia, the law of acceleration, and the law of action-reaction—provide a framework to analyze how athletes initiate, sustain, and change motion during performance. These laws explain both the motion of the athlete's body and the behavior of sports equipment, enabling coaches and trainers to optimize techniques and training protocols.

1. Applications of the First and Second Laws : The First Law, the law of inertia, dictates that an object remains at rest or in uniform motion unless acted upon by an external force. In sports, this is evident when an athlete

must overcome inertia to start moving—such as a sprinter launching off the blocks. The Second Law states that acceleration is directly proportional to the net force acting on an object and inversely proportional to its mass. This principle is used to understand how applying greater force results in faster acceleration, a concept vital in sports like weightlifting, sprinting, and throwing events. For example, the force generated by a pitcher's arm translates into the acceleration of the baseball.

2. Application of the Third Law and Integration : The Third Law, which states that every action has an equal and opposite reaction, is particularly visible in movements like jumping and running. When a basketball player pushes off the ground, the force exerted downward is met by an equal upward force, propelling them into the air. Similarly, swimmers push against the water to generate forward motion. By understanding these principles, athletes can improve performance through refined technique—optimizing body position and force application. Coaches utilize these laws to design training programs that enhance power output, balance, and efficiency, ensuring that the principles of physics are harnessed for peak performance in competitive sports.

- 154.** Explain the types of levers and their application in sports.

Ans :

DELHI 2019

Levers are simple machines that play a crucial role in biomechanics, helping to magnify force and facilitate movement. They are classified into three types: first-class, second-class, and third-class levers. Each type differs based on the relative positions of the fulcrum (pivot point), the effort force, and the load (resistance). In sports, these lever systems are intrinsic to how athletes generate and apply force, thereby influencing performance in a range of activities.

1. Applications of First and Second-Class Levers : A first-class lever, where the fulcrum is positioned between the effort and the load, is commonly seen in movements such as a gymnast performing a balance beam routine, where the body pivots around a point. Second-class levers, with the load situated between the fulcrum and the effort, are exemplified in actions like calf raises. Here, the ball of the foot acts as the fulcrum, the body's weight

is the load, and the muscle force acts as the effort. This arrangement allows athletes to lift significant loads with comparatively less muscular effort, enhancing performance in activities such as jumping and sprinting.

2. **Application of Third-Class Levers and Integration in Sports :** Third-class levers, the most common type in human anatomy, have the effort applied between the fulcrum and the load. This is seen in everyday actions like throwing a ball, where the shoulder acts as the fulcrum, the force generated by the arm muscles is applied between the shoulder and the ball, and the ball represents the load. Such a system allows for rapid movements and increased range of motion, even though it requires greater force. Coaches and trainers use the principles of lever mechanics to optimize athletic techniques, from improving swing mechanics in baseball to refining kicking techniques in soccer. Understanding lever dynamics not only aids in performance enhancement but also in injury prevention by promoting efficient movement patterns that reduce undue strain on muscles and joints.

- 155.** Analyze equilibrium—dynamic & static—and centre of gravity and their application in sports.

Ans :

OD 2014

Equilibrium in biomechanics refers to the balance of forces acting on a body, ensuring stability during both static and dynamic conditions. Static equilibrium occurs when an athlete remains motionless and all forces are balanced, while dynamic equilibrium refers to the maintenance of balance while in motion. In sports, maintaining equilibrium is critical for performance, as even slight deviations can lead to errors or injuries.

1. **Static Equilibrium and Centre of Gravity :** Static equilibrium is largely governed by the centre of gravity (COG), the point at which the body's mass is evenly distributed. In sports like archery or gymnastics, athletes carefully adjust their posture to keep the COG aligned with their base of support, thereby minimizing the chance of tipping over. This stability is crucial for executing precise movements and maintaining control. Coaches often work with athletes to develop techniques that lower the centre of gravity, enhancing balance and stability in activities such as wrestling or figure skating.

2. **Dynamic Equilibrium and Its Applications:** Dynamic equilibrium is essential during movement, where constant adjustments are required to maintain balance. Athletes in sports like soccer, basketball, or skiing must continuously adapt their body positions to counteract external forces such as wind, uneven surfaces, or opponent movements. Training in dynamic balance involves exercises that challenge the vestibular system, proprioception, and muscular coordination. For instance, balance drills and core strengthening are integral parts of training regimens for runners and martial artists to ensure that they remain stable during rapid changes in direction.
3. **Integration into Sports Performance :** By understanding equilibrium and the centre of gravity, coaches can design training programs that improve stability and reduce the risk of falls and injuries. Athletes learn to control their movements more effectively, translating into improved performance across various sports. This understanding also informs equipment design and playing surface modifications, ensuring that athletes perform in an environment that supports optimal balance and movement.

NODIA

- 156.** Evaluate the role of friction in sports.

Ans :

COMP 2020

Friction is the force that resists the relative motion between two surfaces in contact. In sports, friction plays a dual role: it can enhance performance by providing the necessary grip and traction, while excessive friction may hinder movement or lead to energy loss. The manipulation of friction is a key consideration in the design of sports equipment and playing surfaces, as well as in the development of athletic techniques.

1. **Positive Effects of Friction :** In many sports, friction is essential for maintaining control and stability. For instance, in running and sprinting, the friction between an athlete's shoes and the track is vital for propulsion. Similarly, in sports like basketball or soccer, the grip provided by the playing surface allows athletes to change direction quickly and perform agile movements without slipping. The proper management of friction enables athletes to exert maximal force during acceleration and deceleration, thereby improving performance and reducing the risk of falls.

2. **Challenges and Negative Impacts :** While friction is generally beneficial, too much friction can impede performance. In sports like ice hockey or skiing, low friction is desired to allow for smooth, rapid movement. However, if the friction is inconsistent or too high due to poor surface conditions, it can lead to decreased speed and increased wear on equipment. Athletes must adapt their techniques based on the frictional characteristics of the environment. For example, figure skaters rely on minimal friction to execute spins and glides effectively, but must also manage friction during stops and turns to avoid abrupt movements that could lead to injury.
3. **Optimizing Friction Through Equipment and Technique :** Coaches and equipment designers continuously work to optimize friction for different sports environments. Advances in shoe design, surface materials, and maintenance routines are all aimed at achieving the right balance of grip and glide. Athletes also learn to adjust their techniques to account for frictional forces, such as altering stride length or foot placement. Understanding and controlling friction is essential not only for performance enhancement but also for injury prevention, making it a fundamental aspect of sports biomechanics.

- 157.** Describe the concept of projectile motion and its application in sports.

Ans :

OD 2011

Projectile motion describes the curved trajectory that an object follows when it is thrown or propelled near the Earth's surface, under the influence of gravity and without significant air resistance. The path of a projectile is determined by its initial velocity, launch angle, and the acceleration due to gravity. In sports, the principles of projectile motion are crucial for understanding and optimizing the flight of balls, javelins, arrows, and other equipment.

1. **Applications in Ball Sports and Athletics :** In sports like soccer, basketball, and baseball, athletes must apply the principles of projectile motion to accurately pass, shoot, or hit a ball. The optimal launch angle for maximum range is often cited as 45 degrees, though adjustments are made based on the athlete's strength and environmental conditions. In track and field events such as javelin throw

or shot put, athletes carefully modulate their technique to achieve the ideal combination of speed, angle, and spin. Coaches use video analysis and physics-based models to refine an athlete's form, ensuring that the projectile achieves the desired trajectory for maximum distance and accuracy.

2. **Influence of External Factors :** Projectile motion in sports is further complicated by factors such as air resistance, wind, and spin. These variables can alter the flight path significantly, requiring athletes to adjust their technique dynamically. For example, in tennis, players use spin to control the ball's trajectory, causing it to dip or swerve unpredictably. Similarly, golfers must account for wind direction and speed when striking a ball, often making minor adjustments in their swing to achieve the intended flight path.
3. **Integration into Training and Equipment Design :** Understanding projectile motion allows athletes and coaches to optimize performance through technique refinement and equipment modifications. Ball designs, aerodynamic shapes, and training regimens that emphasize proper launch mechanics all derive from the principles of projectile motion. By incorporating these scientific insights, sports professionals can enhance accuracy, range, and overall performance. This integration of physics into training not only boosts athletic capability but also minimizes injury risk by promoting efficient, controlled movements during dynamic play.

- 158.** Explain Newton's First Law (Law of Inertia) and Third Law (Law of Reaction) of Motion. Provide detailed examples of how each law is applied in different sporting situations.

Ans :

FOREIGN 2008

Newton's Laws of Motion are fundamental principles that explain the relationship between an object and the forces acting upon it. The First and Third laws are crucial for understanding movement in sports.

1. **Newton's First Law (Law of Inertia)** states that an object will remain at rest or continue to move at a constant velocity unless acted upon by an external (resultant) force. Inertia is the resistance of any object to a change in its state of motion. In sports, this means a stationary object will not move without a force, and a moving object will not stop or

launching them into the air for the dive.

- 151.** What is Friction? Write the advantages and disadvantages of friction by giving suitable examples from sports.

Ans :

2023

1. Friction in Sports : Friction is a force that opposes motion between two surfaces in contact. It plays a crucial role in various sports by enabling movement, providing grip, and influencing the interaction between athletes, equipment, and playing surfaces.
2. Types of Friction : Friction can be classified into Static Friction and Kinetic Friction:
 - i. Static Friction: The resistance force that prevents an object from moving until a sufficient force is applied.
 - ii. Kinetic Friction: The resistance experienced when an object is already in motion. It is further divided into:
 - iii. Sliding Friction: The frictional force acting when an object slides over a surface.
 - iv. Rolling Friction: The force resisting motion when an object rolls over a surface.

Friction is particularly significant in sports that involve rolling objects, such as tenpin bowling and curling, where surface resistance impacts movement and control.

3. Examples of Friction in Sports

Sprinting: A sprinter exerts force backward and downward into the track. The friction between the foot and the surface prevents slipping and enables forward motion. The force applied by the sprinter's foot is counteracted by friction, which facilitates acceleration in the same direction.

4. Advantages of Friction in Sports

- i. Grip and Control: Friction enables athletes to securely grip equipment such as racquets, balls, or exercise equipment, enhancing performance and control.
- ii. Racing Safety: In Formula One racing, tires are warmed to increase friction, ensuring optimal grip on the track, which enhances both speed and safety.
- iii. Air Resistance in Sports: Air resistance influences sports such as sprinting, cycling, and skiing, where reducing drag is essential for improved performance.

5. Disadvantages of Friction in Sports

- i. Wear and Tear: Continuous friction causes damage to sports equipment, leading to deterioration over time. Without friction, equipment would last indefinitely.
- ii. Blisters and Discomfort: Repeated friction between the feet and shoes can result in painful blisters, affecting an athlete's comfort and performance.

- 152.** What do you understand by projectile trajectory? Explain the factors affecting projectile trajectory in sports.

Ans :

2024

A projectile is an object that is launched into space, either horizontally or at an acute angle, and moves under the influence of gravity. The two primary forces acting on a projectile are gravitational force and air resistance. Air resistance significantly affects the motion of a projectile, and its impact varies based on the object's shape and atmospheric conditions at the time of release.

Trajectory of a Projectile : The trajectory is the curved path that a projectile follows during its motion. Various factors influence this trajectory, determining the object's movement, distance, and final landing point.

Factors Affecting Projectile Trajectory

1. Gravity:
 - i. Gravity is the force exerted by the Earth that pulls objects toward its center.
 - ii. The gravitational force acting on an object is directly proportional to its mass.
 - iii. In the absence of gravity, a projectile would travel in a straight line without curving downward.
2. Speed of Release:
 - i. The speed at which an object is thrown or hit significantly impacts its trajectory.
 - ii. The force applied by muscles determines the projectile's release speed.
 - iii. A greater release speed results in greater distance covered, as seen in javelin and discus throw events.
3. Angle of Release (Projection Angle):
 - i. The angle at which an object is thrown or hit affects its flight path.
 - ii. The ideal angle of release varies depending on the sport or activity.
 - iii. For instance, in basketball, a release angle of more than 45 degrees is needed for a successful shot, whereas in tennis,

player in basketball adopts a low stance for greater stability.

3. **Greater Body Weight (Mass):** Stability is directly proportional to the mass of the athlete. A heavier person is more difficult to move than a lighter one. This is why combative sports like wrestling, judo, and boxing have weight categories to ensure fair competition.
4. **Position of COG within the Base of Support:** An athlete is most stable when the line of gravity (an imaginary vertical line passing through the COG) falls within the centre of the base of support. If the COG moves outside the base, balance is lost. A gymnast walking on a balance beam uses their arms to make small adjustments, shifting their COG to keep it over their small base of support (their feet).

- 161.** Define friction and its different types. Discuss, with examples, how friction can be both an advantage and a disadvantage in the field of sports.

Ans :

FOREIGN 2003

Friction is a force that opposes the motion between two surfaces that are in contact. It always acts in the opposite direction to the object's movement. The main types of friction are static friction (when an object is stationary), and kinetic friction (when an object is moving), which includes sliding and rolling friction. Fluid friction (air or water resistance) also plays a major role in many sports.

Friction is often called a “necessary evil” in sports because it can be both beneficial and detrimental.

1. **Advantages of Friction :** Friction is essential for grip and generating movement.
 - i. **Grip:** In gymnastics, a competitor applies lime powder to their hands to increase friction on the horizontal bar, allowing for a secure grip. Similarly, a badminton player's racket grip relies on friction to prevent it from slipping.
 - ii. **Movement:** In athletics, runners wear shoes with spikes that are designed to increase friction with the track. This allows them to apply greater force to the ground to generate speed and prevents them from slipping while accelerating or changing direction.
2. **Disadvantages of Friction :** Friction can also hinder performance and cause issues.

- i. **Opposing Motion:** In sports like cycling or speed skating, friction between the tires/skates and the surface, as well as air resistance, slows the athlete down and requires them to expend more energy to maintain speed.
- ii. **Wear and Tear / Injury:** Friction is a major cause of wear and tear on sports equipment over time. It can also cause injuries, such as an abrasion or “mat burn” when a player slides across the ground. In weightlifting, friction can damage the skin on the palms, which is why proper technique and equipment are crucial.

NODIA

62. (a) State Newton's Second Law of Motion and explain the relationship between force, mass, and acceleration.
- (b) Apply this law to explain performance in two different sports: shot-put and soccer.

Ans :

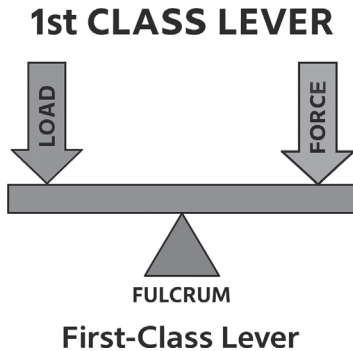
SQP 2018

- (a) Newton's Second Law of Motion, also known as the Law of Momentum, states that the rate of change of momentum of an object is proportional to the resultant force acting on it and occurs in the direction of that force. A simpler expression of this law is the formula $\text{Force} = \text{Mass} \times \text{Acceleration}$ ($F = m \times a$). This relationship explains that the acceleration of an object is directly proportional to the net force applied to it and inversely proportional to its mass. In simple terms, to move an object, a force must be applied. The more force you apply, the greater its acceleration will be. Conversely, for a given force, a heavier (more massive) object will accelerate less than a lighter object.
- (b) This law is fundamental to performance in many sports.
 - i. **Shot-put :** In this event, the goal is to achieve the maximum possible displacement of the shot-put, which has a fixed mass. According to the formula $F = m \times a$, to maximize the acceleration of the shot, the athlete must apply the maximum possible force. An athlete who can generate more force through their technique will produce a greater acceleration on the shot, resulting in it traveling a longer distance. An athlete who exerts less force will achieve a lesser

Ans :

- (a) An object covers less distance when the projected path is at 30 degrees.
- (b) If the initial velocity is low, the object will cover less distance.
- (c) If the weight of the object is more, the impact of gravity will be greater.

168. In reference to the picture answer the following questions :



- (i) In a first-class lever, the fulcrum is located:
 - (a) At one end, with the load and force on the same side
 - (b) Between the load and the force
 - (c) Always at the load end
 - (d) Always at the force end

Ans :

- (b) Between the load and the force
- (ii) Which of the following is a common real-life example of a first-class lever?
 - (a) Wheelbarrow
 - (b) Bottle opener
 - (c) Scissors
 - (d) Fishing rod

Ans :

- (c) Scissors
- (iii) In the human body, which joint/movement often demonstrates a first-class lever mechanism?
 - (a) Elbow joint when lifting a weight in front
 - (b) Head pivoting on the atlas (neck joint)
 - (c) Knee joint when kicking a ball
 - (d) Ankle joint during tiptoeing

Ans :

- (b) Head pivoting on the atlas (neck joint)

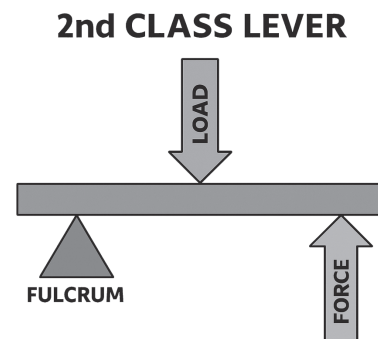
- (iv) One key characteristic of a first-class lever is that it:

- (a) Cannot provide a mechanical advantage
- (b) Always reduces the force required to move the load
- (c) Can either provide a mechanical advantage or disadvantage, depending on fulcrum position
- (d) Only allows rotational movement in one direction

Ans :

- (c) Can either provide a mechanical advantage or disadvantage, depending on fulcrum position

169. In reference to the picture answer the following questions :



- (i) Which of the following is a common real-life example of a second-class lever?
 - (a) Fishing rod
 - (b) Wheelbarrow
 - (c) Scissors
 - (d) Tweezers

Ans :

- (b) Wheelbarrow
- (ii) In the human body, which movement or structure often demonstrates a second-class lever mechanism?
 - (a) Head pivoting on the atlas
 - (b) Standing on tiptoe (calf raise)
 - (c) Flexing the elbow joint with a dumbbell
 - (d) Hip joint during a squat

Ans :

- (b) Standing on tiptoe (calf raise)

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- (d) When the sum of force acting upon the object and sum of the movement acting upon the body is both equal to zero then the body is said to be in _____.

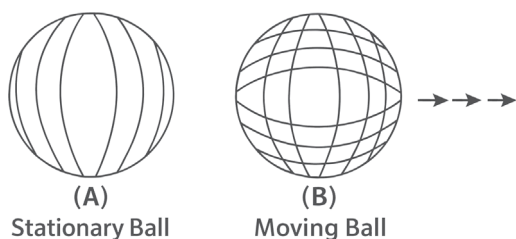
Ans :

- (a) Stability
(b) Position of the intersection of force
(c) Zero
(d) Weight

or

- (d) Equilibrium

165. Study the pictures given below :

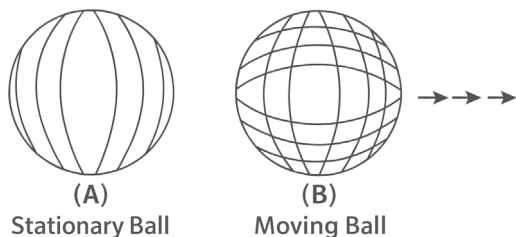


Based on above study and your knowledge, answer the following questions.

- (a) Which law of motion will be applied to initiate motion of the ball as depicted in the illustration (A)?
(b) In illustration (B) which force is acting upon the ball to slow it down?
(c) Which law of motion will determine the quality of bounce ?
(d) _____ of an object directly depends upon the mass of the object and net force applied on it.

Ans :

2023



- (a) First law of motion
(b) Friction
(c) Newton law of action and reaction
(d) Acceleration

166. In reference to the picture answer the following questions :



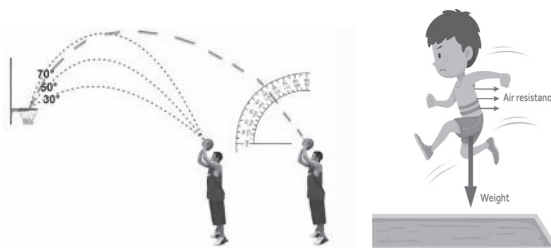
During her gymnastics practice, Zoya was finding it difficult to maintain her balance on the balancing beam. Her coach tried to explain to her about basic principles of equilibrium. According to the principles of equilibrium Centre of gravity plays a very important role.

- (a) _____ C.G helps in increasing stability.
(b) _____ base more stability.
(c) There are two types of equilibrium namely _____ and _____.

Ans :

- (a) Lower C.G helps in increasing stability.
(b) Wider base provides more stability.
(c) There are two types of equilibrium, namely Static Equilibrium and Dynamic Equilibrium.

167. In reference to the picture answer the following questions :



While explaining how to release basketball at a correct angle to successfully score points the basketball coach showed students this picture. Basketball players wanted to know more about projectiles therefore the coach explained to them the factors affecting flight of an object.

- (a) An object covers less distance when the projected path is at _____ degrees.
(b) If the initial velocity is low the object will cover _____ distance.
(c) If the weight of the object is more the impact of gravity will be _____.

displacement.

- ii. Soccer : The law applies to kicking the ball. To make the ball travel at high speed (high acceleration), a player must apply a large force with their kick. When a player wants to make a long, fast pass or shoot powerfully at the goal, they must exert a greater force than they would for a short, gentle pass. The mass of the ball is constant, so the acceleration of the ball is directly proportional to the force applied by the player's kick.

- 163.** (a) What is projectile motion? Explain three key factors that determine the trajectory of a projectile, such as a javelin or a basketball.
- (b) Discuss how two other factors, air resistance and spin, can modify a projectile's flight path, using sporting examples.

Ans :

COMP 2015

- (a) Projectile motion describes the path of any object that, once thrown or struck, continues in motion influenced only by the forces of gravity and air resistance. The path it follows is called a trajectory, which is typically a parabola. Examples in sports include a javelin, a basketball, a golf ball, or even the human body in a long jump. Three key factors that determine this trajectory are:
- i. Speed of Release: This refers to how fast the object is moving when it is released. Generally, a greater release speed results in a greater distance travelled. This is largely determined by the muscular force the athlete can generate.
 - ii. Angle of Release: This is the angle at which the object is projected. In the absence of air resistance, the optimal angle for maximum horizontal distance is 45 degrees. However, the ideal angle varies by sport depending on the objective.
 - iii. Height of Release: This is how high above the ground the object is at the moment of release. For a given speed and angle, a greater height of release will result in the projectile travelling a greater distance.
- (b) The ideal parabolic trajectory is modified by two other significant factors:
- i. Air Resistance (Fluid Friction): This force opposes the motion of objects travelling through the air. The effect of

air resistance increases with the object's speed and surface area. For example, the light weight and large surface area of a badminton shuttlecock cause it to be heavily affected by air resistance, which is why its trajectory is steep and it slows down quickly.

- ii. Spin: Applying a spin to a projectile creates a pressure differential in the surrounding air, causing the object to curve or change direction. This phenomenon is known as the Magnus effect. For example, in cricket, a bowler applies spin to the ball to make it "swing" or curve in the air, deceiving the batsman. In basketball, applying backspin to a shot helps the ball to soften its landing on the rim or backboard, increasing the chances of it going in the hoop.

CASE BASED QUESTION

- 164.** During her gymnastics practice, Zoya was finding it difficult to maintain her balance on the balancing beam. Her coach tried to explain to her about basic principles of equilibrium.



According to the principles of equilibrium centre of gravity plays a very important role.

- (a) The nearer the Centre of Gravity to the Centre of the base of support, the more will be the _____.
- (b) The position of the centre of gravity changes depending upon the _____.
- (c) The sum of all the vertical and horizontal forces acting on the body must be _____.
- (d) Centre of gravity is the average location of an object's _____.

or

- (iii) A key characteristic of second-class levers is that they:
- Provide a speed advantage but no force advantage
 - Always have the fulcrum in the middle
 - Typically provide a force (mechanical) advantage
 - Are not found in the human body

Ans :

- (c) Typically provide a force (mechanical) advantage
- (iv) Which statement best describes a second-class lever's mechanical advantage?
- The effort arm is always shorter than the load arm
 - The effort arm is always longer than the load arm
 - The load arm is always longer than the effort arm
 - The fulcrum is always in the center

Ans :

- (b) The effort arm is always longer than the load arm

170. In reference to the picture answer the following questions :



- (i) Which type of friction exists when two surfaces are in contact but not moving relative to each other?
- Rolling friction
 - Static friction
 - Kinetic friction
 - Fluid friction

Ans :

- (b) Static friction
- (ii) When a person pushes against a heavy box that does not move, the friction preventing motion is:
- Kinetic friction
 - Static friction
 - Rolling friction
 - Fluid friction

Ans :

- (b) Static friction
- (iii) Static friction will increase until it reaches its maximum value, which is determined by:
- The normal force and the coefficient of static friction
 - The size (area) of the contacting surfaces only
 - The applied force alone
 - Gravity acting on nearby objects

Ans :

- (a) The normal force and the coefficient of static friction
- (iv) Static friction converts to kinetic friction when:
- The surfaces begin to slide relative to each other
 - The normal force is reduced to zero
 - The temperature of the surface decreases
 - There is no force applied on the object

Ans :

- (a) The surfaces begin to slide relative to each other

171. In reference to the picture answer the following questions :



- (i) In paragliding and hang gliding, fluid friction primarily refers to:
- Friction between the harness and the pilot's body
 - Resistance of the air acting against the glider
 - Friction between the ropes and the canopy
 - Resistance of the pilot's shoes on the ground

Ans :

- (b) Resistance of the air acting against the glider

17. Micro cycle is
 (a) 3 to 10 weeks
 (b) 3 to 10 days
 (c) 3 to 10 hrs
 (d) None from above

Ans :

DELHI 2006

- (b) 3 to 10 days

A microcycle is a short-term training segment that typically spans 3 to 10 days. It focuses on immediate training goals, skill refinement, and recovery, forming the building blocks for longer training cycles within an overall periodized plan.

18. The isokinetic method was developed by.
 (a) HC Buck
 (b) Joy Perrny
 (c) J.J. Perrine
 (d) JJ Coubertin

Ans :

OD 2002

- (c) J.J. Perrine

J.J. Perrine is credited with developing the isokinetic training method, which controls the speed of movement throughout the exercise. This method allows for consistent muscle performance and is instrumental in rehabilitation and strength training programs.

19. An exercise in which movement is visible.
 (a) Isometric
 (b) Isotonic
 (c) Isokinetic
 (d) Isonomic

Ans :

SQP 2010

- (b) Isotonic

Isotonic exercises are characterized by observable movement as muscles change length during contraction. This dynamic exercise type, such as lifting weights or performing squats, contrasts with isometric exercises where muscles contract without visible movement.

20. Under which kind of strength would you put Shotput?
 (a) Strength Endurance
 (b) Explosive Strength
 (c) Maximum strength
 (d) Speed Strength

Ans :

COMP 2012

- (b) Explosive Strength

Shotput requires a powerful, rapid contraction of muscles to propel the shot put with maximum

force over a short period. This performance relies on explosive strength, which is essential for generating quick bursts of power in short-duration activities.

21. Which is not a type of endurance according to the nature of activities
 (a) Basic Endurance
 (b) General Endurance
 (c) Specific Endurance
 (d) Speed Endurance

Ans :

DELHI 2005

- (d) Speed Endurance

Basic, general, and specific endurance are standard classifications based on activity nature. Speed endurance, while important, is more closely associated with the ability to sustain speed rather than a distinct category of endurance as defined by traditional endurance classifications.

22. 400 m sprint event comes under
 (a) Speed Endurance
 (b) Short Endurance
 (c) Medium Endurance
 (d) Long Endurance

Ans :

OD 2011

- (a) Speed Endurance

The 400m sprint is a high-intensity event that requires athletes to maintain near-maximal speed over a relatively short duration. This event is categorized as speed endurance because it combines elements of both speed and anaerobic endurance to sustain high performance.

23. There will be no variation in the pace of inactivity in
 (a) Fartlek Method
 (b) Continuous Method
 (c) Interval Method
 (d) None of the Above

Ans :

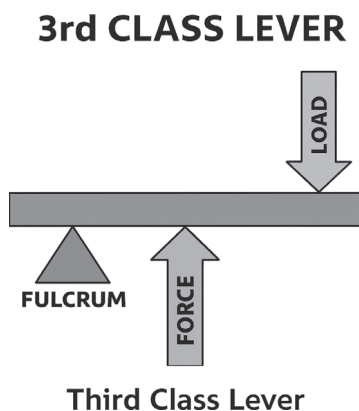
SQP 2013

- (b) Continuous Method

The continuous method involves maintaining a steady pace without fluctuations in intensity or rest intervals. This uniformity distinguishes it from methods like Fartlek or interval training, where variations in pace are deliberately introduced.

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173. In reference to the picture answer the following questions :



- (i) Which of the following is a common real-life example of a third-class lever?
- Wheelbarrow
 - Tweezers
 - Scissors
 - Bottle opener

Ans :

- (b) Tweezers
- (ii) In the human body, a classic example of a third-class lever is:
- Head pivoting on the atlas (neck joint)
 - Standing on tiptoe (ball of the foot)
 - Elbow flexion using the biceps muscle
 - Hip joint when standing upright

Ans :

- (c) Elbow flexion using the biceps muscle
- (iii) A key characteristic of third-class levers is that they:
- Provide a large mechanical (force) advantage
 - Typically offer a speed and range-of-motion advantage
 - Always have the load in the middle
 - Are rarely found in the human body

Ans :

- (b) Typically offer a speed and range-of-motion advantage
- (iv) Which statement best describes the mechanical advantage of a third-class lever?
- The effort arm is always longer than the load arm
 - The load arm is always longer than the effort arm, creating a mechanical disadvantage but a speed advantage

- The load is never moved by the applied force
- The fulcrum and load are the same distance from the force

Ans :

- (b) The load arm is always longer than the effort arm, creating a mechanical disadvantage but a speed advantage

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- (ii) Which factor increases the fluid friction (air resistance) on a glider?
- Decreasing surface area
 - Reducing the speed of the glider
 - Increasing the speed or cross-sectional area of the glider
 - Streamlining the design of the wing

Ans :

- (c) Increasing the speed or cross-sectional area of the glider
- (iii) To reduce fluid friction during flight, paragliders and hang gliders often:
- Use flat, box-like designs
 - Increase the thickness of the wing
 - Utilize streamlined, aerodynamic shapes
 - Add extra weight to the glider

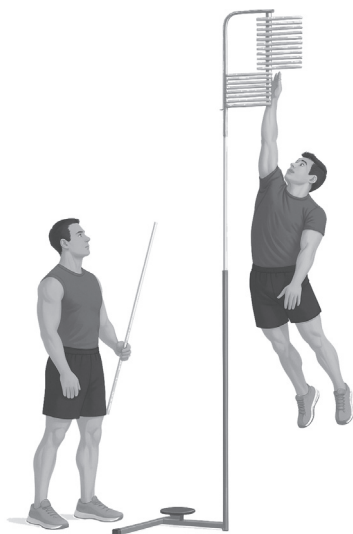
Ans :

- (c) Utilize streamlined, aerodynamic shapes
- (iv) Which term describes the upward force that helps a paraglider or hang glider stay aloft?
- Thrust
 - Drag
 - Lift
 - Gravity

Ans :

- (c) Lift

172. In reference to the picture answer the following questions :



- (i) The fitness component primarily measured by the Vertical Jump Test is:
- Cardiovascular endurance
 - Muscular strength of the arms

- Explosive leg power
- Flexibility in the lower body

Ans :

- (c) Explosive leg power
- (ii) In a standard Vertical Jump Test protocol, the participant:
- Balances on one leg for 30 seconds
 - Stands flat-footed, reaches as high as possible, then jumps and touches the highest reachable vane or marker
 - Completes as many jumps as possible in 1 minute
 - Sits on the floor and stretches forward

Ans :

- (b) Stands flat-footed, reaches as high as possible, then jumps and touches the highest reachable vane or marker

Ans :

- (iii) A common way to score the Vertical Jump Test is by:
- Calculating the body mass index (BMI)
 - Measuring the time spent in the air during the jump
 - Subtracting the standing reach height from the jump reach height
 - Counting the number of jumps performed in 60 seconds

Ans :

- (c) Subtracting the standing reach height from the jump reach height
- (iv) Which of the following is true regarding the Vertical Jump Test?
- It is only used to measure flexibility in the ankles
 - It helps assess explosive power in activities like basketball and volleyball
 - It is not applicable to sports performance testing
 - It solely measures arm strength

Ans :

- (b) It helps assess explosive power in activities like basketball and volleyball

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are integral. Mental resilience is built to help athletes handle competition pressures effectively.

- Competitive Exposure : Regular participation in tournaments, matches, and competitive events is essential. This not only hones skills but also builds the confidence and experience needed to perform at higher levels.

3. INTRODUCTION TO SPORTS TRAINING CYCLE – MICRO, MESO AND MACRO CYCLES

Organizing training into distinct cycles helps optimize performance, manage workload, and reduce the risk of overtraining or injuries. The sports training cycle is divided into three primary segments : microcycle, mesocycle and macrocycle.

3.1 Micro Cycle

- Definition : The microcycle represents a short-term training phase, typically lasting from a few days up to one week.
- Purpose : It focuses on specific aspects of training such as skill development, recovery, and preparation for immediate competitions.
- Example : A sprinter's microcycle may include focused sessions on speed drills, strength conditioning and flexibility exercises, interspersed with adequate recovery periods to optimize performance.

3.2 Meso Cycle

- Definition : A mesocycle is a medium-term training phase, spanning several weeks to a few months.
- Purpose : It bridges the gap between the short-term microcycle and long-term macrocycle, emphasizing the development of core skills and physical attributes through a progressive training regimen.
- Example : A football team might follow an 8 to 12-week mesocycle that integrates tactical drills, endurance training, strength conditioning, and skill enhancement sessions to prepare for the upcoming season.

3.3 Macro Cycle

- Definition : The macrocycle is a long-term training framework that can extend from several months to a full year or even longer, covering the entire competitive season.
- Purpose : It is designed to guide an athlete or team through various phases of training,

ensuring that peak performance is achieved at the right moment—typically during major competitions or tournaments.

- Example : Olympic athletes often follow a macrocycle that encompasses the preparatory phase, competitive phase, and transition phase, strategically designed to culminate in peak performance at the Olympic Games.

4. TYPES & METHODS TO DEVELOP STRENGTH, ENDURANCE AND SPEED

Building a robust physical foundation requires targeted training to enhance core fitness components—strength, endurance, and speed—which are critical for athletic success.

4.1 Strength Development

Strength training is focused on enhancing the ability of muscles to produce force. This is particularly important for sports that require explosive power, stability, and the ability to resist external forces.

Techniques for Strength Development:

- Isometric Training : Involves holding a position where the muscle contracts without changing its length. Examples include planks and wall sits that enhance muscle stabilization.
- Isotonic Training : Involves dynamic movements where muscles lengthen and contract. Common activities include weightlifting, resistance band exercises, and machine-based workouts.
- Plyometric Training : Focuses on explosive movements such as jump squats, box jumps, and plyo push-ups to build power and speed.
- Bodyweight Exercises : These exercises, such as push-ups, pull-ups, squats, and lunges, utilize the athlete's body weight to develop muscular strength and endurance.

4.2 Endurance Development

Endurance training aims to improve the body's ability to sustain prolonged physical activity. It is essential for athletes in sports that demand continuous energy output over extended periods.

Methods for Endurance Development:

- Continuous Training : Involves engaging in activities like long-distance running, swimming, or cycling at a steady pace to build cardiovascular endurance.
- Interval Training : Alternates between high-intensity bursts and periods of lower intensity or rest, effectively improving both aerobic

Fartlek, a Swedish term meaning “speed play,” was developed in Sweden by Gösta Holmér. This method blends continuous and interval training, making it a popular endurance-training technique internationally, particularly for its ability to vary intensity naturally.

5. If a muscle contracts and changes its length to produce force, the contraction type is :
- Isotonic
 - Isometric
 - Isokinetic
 - None of these.

Ans :

COMP 2020

(a) Isotonic
In isotonic contraction, the muscle changes length (shortening or lengthening) while producing force. This contrasts with isometric contraction, where the muscle produces force without a change in length, making isotonic exercises ideal for dynamic movements.

6. **Assertion (A) :** For improvement of performance in long distance running, continuous training is effective.

Reason (R) : Continuous method of training improves basic endurance.

Which one of the following statements is correct?

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is not the correct explanation of A.
- A is true, but R is false.
- A is false, but R is true.

Ans :

2023-24

(a) Both A and R are true and R is the correct explanation of A.

Continuous training builds basic endurance by sustaining prolonged activity. This directly benefits long-distance runners, as the method enhances cardiovascular and muscular endurance, thereby explaining the effectiveness of continuous training for performance improvement.

7. What do you mean by iso and metric?
- Iso means constant and metric means length
 - Iso means change and metric means size
 - Iso means constant and metric means velocity
 - Iso means size and metric means constant

Ans :

2023-24

(a) Iso means constant and metric means length
“Iso” signifies constant, and “metric” refers to

measurement, particularly length. In isometric exercises, the muscle generates force without changing its length, embodying the principle that the length remains constant during contraction.

8. Jumping on the spot is an example of _____.
 - Iso-metric
 - Iso-tonic
 - Iso-kinetic
 - Iso-kinesthetic

Ans :

2022-23

(b) Iso-tonic
Jumping on the spot involves visible movement and changes in muscle length, classifying it as an isotonic activity. Unlike isometric exercises, where muscles contract without movement, isotonic exercises require dynamic actions and observable motion.

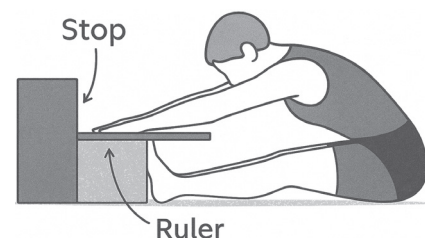
9. Take-off in Long jump is an example of _____ strength.
 - Explosive strength
 - Maximum strength
 - Strength endurance
 - Static strength

Ans :

2022-23

(a) Explosive strength
The take-off phase in long jump requires rapid, powerful muscle contractions to propel the athlete forward. This burst of power, which is short in duration but high in intensity, is characteristic of explosive strength essential for generating maximum force quickly.

10. Name the component which is measured by this test?



- Endurance
- Speed
- Flexibility
- coordinative ability

Ans :

Term-I, 2021-22

(c) Flexibility
The test in question evaluates the range of motion available at a joint, which directly measures

2. **Time Efficiency** : This training method is particularly time-efficient, as it allows athletes to work on various fitness components in a single session. This is especially beneficial for those with limited training time.
3. **Customizable Workouts** : Exercises in a circuit can be tailored to meet the specific needs of different sports, making it a highly versatile training option. Coaches can modify intensity, duration, and exercises to suit individual or team goals.
4. **Improved Recovery and Endurance** : The minimal rest intervals in circuit training help improve an athlete's ability to recover quickly between exercises, thereby boosting overall endurance and work capacity.
5. **Enhanced Motivation and Group Dynamics** : When performed in a group setting, circuit training fosters a sense of camaraderie and healthy competition, which can significantly enhance motivation and engagement among athletes.

MULTIPLE CHOICE QUESTION

1. Fartlek Training is used to develop _____.
 (a) Endurance
 (b) Strength
 (c) Flexibility
 (d) Speed

Ans :

2023

(a) Endurance
 Fartlek training involves varying speeds during continuous exercise. This "speed play" method enhances cardiovascular efficiency and muscular endurance by simulating real-game demands, making it an ideal training technique for improving an athlete's endurance capacity.

2. The ability to tolerate higher concentration of _____ can help in improving endurance performance.
 (a) Lactic acid
 (b) Hydrochloric acid
 (c) Acetic acid
 (d) Sulphuric acid

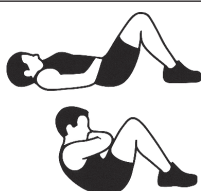
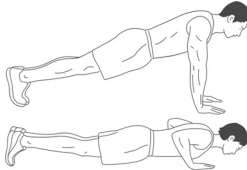
Ans :

2023

(a) Lactic acid

Endurance performance improves when an athlete adapts to higher lactic acid concentrations. Increased tolerance delays fatigue by allowing muscles to function efficiently despite lactic acid buildup, which is essential for prolonged high-intensity efforts during competition.

3. Match the following

1.		(i)	Lower body flexibility
2.		(ii)	Upper body strength
3.		(iii)	Abdominal strength the Endurance
4.		(iv)	Speed

1 2 3 4

- (a) (iii) (ii) (i) (iv)
 (b) (iii) (i) (iv) (ii)
 (c) (iii) (i) (ii) (iv)
 (d) (iii) (iv) (i) (ii)

Ans :

Term-I, 2021-22

(c) 1-(iii), 2-(i), 3-(ii), 4-(iv)
 Each image correctly matches the fitness component it tests: The partial curl-up (1) assesses abdominal strength (iii), the sit-and-reach test (2) measures lower body flexibility (i), the push-up (3) tests upper body strength (ii), and the sprint start (4) measures speed (iv).

4. Fartlek training was developed in
 (a) Sweden
 (b) The USA
 (c) India
 (d) The UK.

Ans :

SQP 2020

(a) Sweden

CHAPTER 9

TRAINING IN SPORTS

SUMMARY

1. SPOTS TRAINING

Sports training is a meticulously planned and scientifically driven process aimed at enhancing an athlete's physical, psychological, and technical performance. This multifaceted approach not only focuses on improving core physical attributes such as strength, endurance, speed, flexibility, and coordination but also emphasizes mental conditioning, strategic goal setting, and continuous evaluation. The overall aim is to prepare athletes for peak performance in competitions while ensuring long-term athletic development and injury prevention.

2. CONCEPT OF TALENT IDENTIFICATION AND TALENT DEVELOPMENT IN SPORTS

Identifying raw talent early and nurturing it through systematic development is fundamental to the success of any sports program. This process ensures that individuals with the highest potential are given the right opportunities to excel.

2.1 Talent Identification in Sports

Talent identification is a systematic process of recognizing individuals who have the innate potential to succeed in a particular sport. This involves comprehensive assessments that encompass various dimensions of an athlete's profile.

Key Aspects of Talent Identification:

1. **Physical Characteristics** : Coaches evaluate attributes such as body composition, muscle structure, height, weight, and overall flexibility. These factors determine an athlete's suitability for specific sports and their capacity to develop further.
2. **Motor Skills** : Assessments focus on an individual's speed, agility, coordination, balance and reaction time. These fundamental motor skills form the basis for athletic

performance and are critical for almost every sport.

3. **Psychological Traits** : The mental aspects of performance, including motivation, focus, determination, resilience, and stress management, are considered. Psychological evaluations help in understanding how an athlete copes with pressure and competition.
4. **Genetic Factors** : Inherited traits and family history of athletic performance can be indicators of potential, guiding early specialization in certain sports.
5. **Technical Proficiency** : Basic sport-specific skills are assessed, such as dribbling in basketball, striking in cricket, or swimming techniques. Early technical competence can be a predictor of future success in a sport.

2.2 Talent Development in Sports

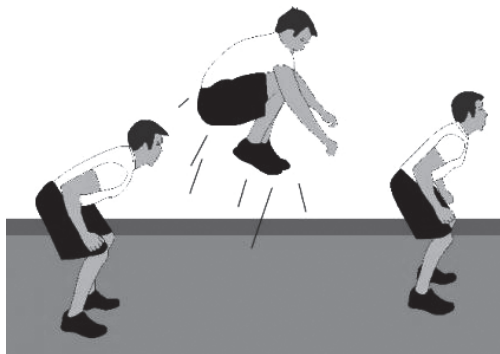
Once potential is identified, talent development becomes the cornerstone of an athlete's journey. This phase involves a well-structured training program designed to refine skills and elevate performance to competitive levels.

Essential Elements of Talent Development:

1. **Progressive Training Programs** : Athletes undergo training plans that gradually increase in intensity and complexity. This progressive approach ensures continuous improvement and helps prevent plateaus.
2. **Specialized Coaching** : Expert coaches provide personalized guidance and technical training. They tailor sessions to address specific needs, correct flaws, and enhance strengths.
3. **Nutrition and Recovery** : Proper nutrition, hydration, and rest are crucial components. Customized diet plans and recovery protocols are developed to ensure that athletes remain at their peak, recover quickly, and reduce the risk of injuries.
4. **Mental Conditioning** : Psychological training techniques, including visualization, positive self-talk, stress management and goal setting,

flexibility. It assesses how far an individual can stretch or move their joints, reflecting the effectiveness of their flexibility training.

11. Identify the component of fitness which is tested through this exercise.



- (a) Maximum strength
- (b) Explosive strength
- (c) Strength endurance
- (d) Static strength

Ans :

Term-I, 2021-22

- (b) Explosive strength

This exercise involves rapid, powerful movements that demand high-force output in a short time span. It tests an athlete's explosive strength—the ability to generate maximal force quickly—which is critical for performance in explosive sports events like jumping or sprinting.

12. The performance enhancement in the future can be predicted based on
- (a) Physiological factor
 - (b) Physical factor
 - (c) Talent indicators
 - (d) All of the above

Ans :

DELHI 2001

- (d) All of the above

Future performance relies on multiple factors including physiological, physical, and talent indicators. Together, these components provide a comprehensive overview of an athlete's potential, ensuring that predictions regarding future performance are well-rounded and accurate.

13. Psychological factors contributing to talent identification is
- (a) Cognitive
 - (b) Emotional
 - (c) Personality traits
 - (d) All of the above

Ans :

OD 2004

- (d) All of the above

Cognitive skills, emotional resilience, and personality traits all play crucial roles in talent identification. These psychological factors help determine an athlete's mental readiness and potential to handle competitive pressures, making them integral to the selection process.

14. Talent identification is a _____ process
- (a) General process
 - (b) Scientific process
 - (c) Specific process
 - (d) None of the above

Ans :

FOREIGN 2007

- (b) Scientific process

Talent identification involves systematic testing, objective measurements, and evidence-based assessments. This scientific approach ensures that potential is evaluated accurately, allowing coaches and sports scientists to make informed decisions about an athlete's future in competitive sports.

15. Meso cycle is training of
- (a) one week
 - (b) 4 to 10 days
 - (c) 3 to 6 weeks
 - (d) Three 3 months

Ans :

SQP 2003

- (c) 3 to 6 weeks

A mesocycle represents a medium-term training phase typically lasting between 3 to 6 weeks. It bridges short-term microcycles and long-term macrocycles, focusing on progressively enhancing specific physical attributes while allowing for appropriate adaptation and recovery.

16. Transitional Phase is a
- (a) rest and recovery period
 - (b) training period
 - (c) competition period
 - (d) fitness period

Ans :

COMP 2008

- (a) Rest and recovery period

The transitional phase is designated for rest and recovery after intense training cycles. It allows athletes to recuperate physically and mentally, reducing the risk of overtraining while preparing the body for the next phase of structured training.

and anaerobic endurance.

3. **Fartlek Training** : A flexible form of interval training that incorporates variable speeds and intensities throughout a run, enhancing overall stamina and cardiovascular health.
4. **Circuit Training** : Combines different exercises targeting various muscle groups with minimal rest in between, boosting both muscular and cardiovascular endurance simultaneously.

4.3 Speed Development

Speed is a critical component in sports where quick movements and rapid acceleration are required. Training to improve speed focuses on optimizing neuromuscular coordination and enhancing muscle power.

Approaches to Speed Development:

1. **Sprint Drills** : Repetitive short sprints are used to improve acceleration and top-end speed, especially in sports like track and field.
2. **Agility Drills** : Exercises like ladder drills, cone drills, and shuttle runs enhance the ability to change direction quickly and improve overall speed.
3. **Overspeed Training** : Techniques such as running downhill or using resistance bands help athletes train at speeds above their normal maximum, thereby increasing leg turnover and speed.

5. TYPES & METHODS TO DEVELOP FLEXIBILITY AND COORDINATIVE ABILITY

Flexibility and coordination are integral components of athletic performance. They ensure that movements are executed efficiently, reduce the risk of injury, and enhance overall agility.

5.1 Flexibility Development

Flexibility refers to the range of motion available at a joint or group of joints. It is crucial for allowing smooth and efficient movements, which can prevent injuries and improve performance in various sports.

Techniques for Enhancing Flexibility:

1. **Static Stretching** : Involves holding a stretch position for 15-30 seconds, which gradually elongates muscles. Common static stretches include hamstring stretches and quadriceps stretches.
2. **Dynamic Stretching** : Involves moving parts of your body through a full range of motion in a controlled manner, such as leg swings or arm circles, to prepare muscles for activity.

3. **Proprioceptive Neuromuscular Facilitation (PNF) Stretching** : A more advanced technique involving a combination of passive stretching and isometric contractions, typically performed with a partner to achieve deeper stretches.

5.2 Coordination Development

Coordination is the ability to execute movements with precision and fluidity. It involves the harmonious functioning of muscles and nerves to produce well-timed and accurate movements.

Approaches to Improve Coordination:

1. **Balance Training** : Exercises using stability balls, BOSU balls, or balance boards help improve body awareness and stability, which are essential for coordinated movements.
2. **Reaction Drills** : Quick-response activities, such as catching or dodging objects, train the nervous system to respond promptly to stimuli.
3. **Hand-Eye Coordination Exercises** : Activities like juggling, ball passing, or target practice improve the synchronization between visual inputs and motor responses.
4. **Footwork Drills** : Ladder drills, cone drills, and directional change exercises enhance the speed and precision of lower body movements.

6. CIRCUIT TRAINING – INTRODUCTION & ITS IMPORTANCE

Circuit training is a dynamic and versatile workout method that has gained popularity across sports due to its efficiency and comprehensive approach to fitness.

6.1 Introduction to Circuit Training

Circuit training involves performing a series of exercises in succession with minimal rest between each set. Each exercise targets different muscle groups, ensuring that multiple aspects of fitness—such as strength, endurance, agility, and flexibility—are addressed in one comprehensive session.

6.2 Benefits and Importance of Circuit Training

1. **Comprehensive Fitness** : Circuit training offers a full-body workout that improves muscular strength, cardiovascular endurance, and flexibility simultaneously. It is an excellent method for athletes who need to maintain high levels of fitness across multiple domains.

- 24.** The Swedish word meaning speed play is _____
- Fartlek Method
 - Continuous Method
 - Pace Method
 - None of the Above

Ans :

COMP 2015

(a) **Fartlek Method**
“Fartlek” is a Swedish term that translates to “speed play.” This training method incorporates variable speeds and intensities within a continuous workout, providing a playful yet effective approach to building endurance and agility.

- 25.** Which is not a type of Speed

- Reaction
- Sprinting
- Acceleration
- Speed endurance

Ans :

DELHI 2019

(d) **Speed Endurance**
Reaction, sprinting, and acceleration are direct components of speed. Speed endurance, however, involves maintaining speed over time, making it more of a measure of sustained performance rather than a pure speed component. It is typically considered a part of endurance training rather than pure speed training.

- 26.** What type of speed is defined as the ability to maintain maximal speed for maximal distance and maximum duration?

- Acceleration ability
- Locomotor ability
- Movement ability
- Reaction ability

Ans :

OD 2014

(b) **Locomotor Ability**
Locomotor ability refers to an athlete’s capacity to sustain high-speed movement over a given distance and time. This quality is crucial for sports where maintaining near-maximal speed is essential for overall performance.

- 27.** Acceleration run and pace run can be two methods of improving

- Flexibility
- Speed
- Endurance
- Strength

Ans :

SQP 2016

(b) **Speed**

Both acceleration runs and pace runs are designed to enhance an athlete’s speed. They train the body to improve quick starts and maintain high-speed movement, thereby directly contributing to overall improvements in sprinting performance.

- 28.** Which is not a type of Flexibility?

- Active
- Passive
- Ballistic
- Stretch

Ans :

COMP 2018

(d) **Stretch**
Active, passive, and ballistic flexibility represent specific methods of stretching and flexibility training. “Stretch” is a general term for the action performed during these exercises rather than a distinct type of flexibility.

- 29.** In which method is stretching done rhythmically?

- Slow stretch
- Slow stretch and hold
- Ballistic method
- PNF

Ans :

DELHI 2020

(c) **Ballistic Method**
The ballistic method involves rhythmic, bouncing movements to push the muscles beyond their typical range of motion. This dynamic approach differs from slow or static stretching methods, which involve holding a stretch without movement.

- 30.** Which of the following factors does not influence flexibility?

- Structure of joints
- Proper warming-up
- Body temperature
- None of these

Ans :

OD 2017

(d) **None of these**
All the factors listed—joint structure, proper warming-up, and body temperature—play significant roles in determining flexibility. Each element is essential in preparing muscles for stretching and enhancing overall range of motion.

- 31.** What are the necessary steps in improving flexibility?

- Proper warm-up
- Proper stretching
- Repetition of exercise
- All of these

efficiency and power. This method improves the rate of force development, enabling athletes to accelerate quickly and perform explosive actions during competition.

- 45.** Which method is commonly used to improve aerobic endurance?
- Interval training
 - Resistance training
 - Static stretching
 - Balance exercises

Ans :

FOREIGN 2019

(a) Interval training
Interval training is commonly used to improve aerobic endurance by alternating periods of high-intensity effort with recovery intervals. This method enhances cardiovascular efficiency, increases oxygen uptake, and builds stamina, enabling athletes to sustain prolonged activity during competitive and training scenarios.

- 46.** Continuous training is best described as:
- A series of short sprints
 - Maintaining a steady, moderate-intensity exercise over time
 - High-intensity interval exercise
 - Isolated strength training sessions

Ans :

DELHI 2016

(b) Maintaining a steady, moderate-intensity exercise over time
Continuous training involves maintaining a steady, moderate-intensity exercise for an extended duration. This method improves aerobic capacity, enhances cardiovascular endurance, and promotes sustained energy output, making it a fundamental approach for developing endurance in various athletic disciplines.

- 47.** Which method primarily develops speed through short, intense bursts of effort?
- High-intensity interval training
 - Continuous endurance training
 - Resistance training
 - Static stretching

Ans :

OD 2020

(a) High-intensity interval training
High-intensity interval training (HIIT) primarily develops speed by incorporating short, intense bursts of effort followed by recovery periods. This method enhances both anaerobic and aerobic

systems, improves muscle power, and increases the ability to perform rapid, explosive movements effectively in sports.

- 48.** Which method is most effective for improving flexibility using static stretches?
- Dynamic stretching
 - Static stretching
 - Isometric exercises
 - Plyometric training

Ans :

SQP 2014

(b) Static stretching
Static stretching, which involves holding a stretch for an extended period, is most effective for improving flexibility. It gradually elongates muscles, increases range of motion, and reduces the risk of injury by relaxing muscle fibers after exercise, supporting recovery and overall mobility.

- 49.** Which method uses active, movement-based stretches to prepare muscles for exercise?
- Static stretching
 - Dynamic stretching
 - Resistance training
 - Isometric training

Ans :

COMP 2018

(b) Dynamic stretching
Dynamic stretching uses active, movement-based stretches to prepare muscles for exercise by increasing blood flow and warming up tissues. It improves neuromuscular coordination and flexibility, making it ideal for pre-activity warm-ups that enhance performance and reduce injury risk in sports.

- 50.** Which type of training focuses on exercises that improve balance and coordination?
- Resistance training
 - Coordinative training
 - Endurance training
 - Flexibility training

Ans :

DELHI 2017

(b) Coordinative training
Coordinative training focuses on exercises that improve balance, agility, and overall coordination. This training involves drills that challenge an athlete's stability and reaction time, thereby enhancing motor skills, reducing injury risk, and contributing to superior performance in dynamic sporting environments.

toward their highest competitive capabilities.

- 38.** What is a micro cycle in the sports training cycle?
- A single training session
 - A week-long training segment
 - A month-long planning phase
 - An annual training plan

Ans :

SQP 2002

- (b) A week-long training segment

A micro cycle in sports training is a short-term, typically week-long, segment of the overall training program. It focuses on specific daily workouts and immediate objectives, serving as the basic building block for meso and macro cycles in systematic periodization.

- 39.** A meso cycle in training is best defined as:
- A single workout session
 - An intermediate phase spanning several weeks to months
 - An annual training plan
 - A daily practice routine

Ans :

COMP 2010

- (b) An intermediate phase spanning several weeks to months

A meso cycle is an intermediate phase within a training program that lasts several weeks to months. It focuses on specific training goals and adaptations, bridging the gap between individual micro cycles and the overall macro cycle to ensure progressive development.

- 40.** What does a macro cycle represent in sports training?
- A single day's training
 - A weekly workout plan
 - An entire season or annual training plan
 - A short-term exercise session

Ans :

FOREIGN 2012

- (c) An entire season or annual training plan

A macro cycle is the longest phase in the training cycle, typically covering an entire season or year. It outlines the overall training plan, incorporating various meso and micro cycles to structure long-term development, periodization, and peak performance timing for athletes.

- 41.** Which cycle is the shortest in the training cycle?
- Macro cycle
 - Meso cycle
 - Micro cycle
 - Annual cycle

Ans :

DELHI 2005

- (c) Micro cycle

The micro cycle is the shortest component of the training cycle, usually lasting about one week. It focuses on detailed planning of daily workouts and short-term goals, forming the foundation upon which meso and macro cycles are built for systematic athletic development.

- 42.** Which training cycle covers an entire competitive season?

- Micro cycle
- Meso cycle
- Macro cycle
- Daily cycle

Ans :

OD 2011

- (c) Micro cycle

The macro cycle encompasses the entire competitive season or year. It provides an overarching framework for training, integrating various meso and micro cycles, to ensure that athletes peak at the appropriate time and achieve optimal performance during critical competitions.

- 43.** Which method is primarily used for developing muscular strength?

- Resistance training
- Endurance training
- Flexibility training
- Aerobic exercise

Ans :

SQP 2013

- (a) Resistance training

Resistance training is primarily used to develop muscular strength by applying external loads to muscles. This method stimulates muscle fiber recruitment and growth, increasing force production and enhancing overall strength, which is essential for improved performance and injury prevention in sports.

- 44.** Which training method is most effective for developing speed through explosive movements?

- Resistance training
- Plyometric training
- Continuous endurance training
- Flexibility training

Ans :

COMP 2015

- (b) Plyometric training

Plyometric training is most effective for developing speed because it focuses on explosive, rapid movements that enhance neuromuscular

Ans :

COMP 2009

(d) All of these

Improving flexibility requires a comprehensive approach that includes a proper warm-up, effective stretching techniques, and consistent repetition of exercises. Each step is crucial for safely increasing range of motion and preventing injury.

- 32.** The ability to coordinate body part movements with one another and about a definite goal-oriented body movement is known as:

(a) Balance Ability
(b) Adaptation Ability
(c) Rhythm Ability
(d) Coupling Ability

Ans :

FOREIGN 2001

(d) Coupling Ability

Coupling ability refers to the synchronization of different body parts to execute coordinated movements toward a specific goal. It ensures fluidity and efficiency in motion, which is essential for achieving optimal performance in complex athletic activities.

- 33.** The ability to attain a high level of fine-tuning of movement phases is known as:

(a) Differentiation Ability
(b) Orientation Ability
(c) Adaptation Ability
(d) Coupling Ability

Ans :

SQP 2004

(a) Differentiation Ability

Differentiation ability is the capacity to precisely control and fine-tune individual phases of a movement. This skill enhances technical execution and overall performance by ensuring each component of a complex movement is performed accurately.

- 34.** What kind of coordinate abilities are defined as determining a body's position and its part in time and space concerning gravity and moving objects?

(a) Differentiation Ability
(b) Orientation Ability
(c) Adaptation Ability
(d) Coupling Ability

Ans :

COMP 2007

(b) Orientation Ability

Orientation ability is the skill to accurately perceive and control the body's position in relation to the surrounding environment, gravity, and moving objects. It is critical for maintaining

balance and executing movements effectively in dynamic sports environments.

- 35.** What does talent identification in sports refer to?

(a) The process of training athletes
(b) The systematic process of recognizing potential
(c) The process of competition scheduling
(d) The development of coaching strategies

Ans :

DELHI 2003

(b) The systematic process of recognizing potential
Talent identification in sports is the systematic process of recognizing young individuals with exceptional physical, psychological, and technical potential. It involves evaluating skills and attributes to predict future success, enabling focused training and resource allocation to nurture promising athletes.

- 36.** Talent development in sports is best described as:

(a) Immediate competition performance
(b) The process of nurturing and enhancing identified potential
(c) Random participation in events
(d) Exclusive focus on physical strength

Ans :

OD 2008

(b) The process of nurturing and enhancing identified potential

Talent development in sports refers to the ongoing process of nurturing, refining, and enhancing the skills and abilities of identified athletes. It involves structured training, education, and support to maximize potential and achieve long-term success in competitive sporting environments.

- 37.** How does talent identification differ from talent development?

(a) Identification trains athletes; development does not
(b) Identification finds potential; development nurtures it
(c) Both are identical processes
(d) Development occurs before identification

Ans :

FOREIGN 2006

(b) Identification finds potential; development nurtures it

Talent identification focuses on spotting potential in athletes based on performance indicators, while talent development involves nurturing that potential through structured training, support, and coaching. This sequential approach ensures that promising talents are progressively guided

- 51.** Which training method improves coordination by incorporating agility drills?
- Flexibility training
 - Agility drills
 - Endurance training
 - Resistance training

Ans :

OD 2007

- (b) Agility drills

Agility drills improve coordination by challenging an athlete's ability to change direction rapidly and maintain balance. These drills enhance neuromuscular control, refine motor patterns, and boost overall coordination, which are essential for executing quick, precise movements in competitive sports.

- 52.** What is circuit training in sports?
- A single exercise repeated continuously
 - A series of varied exercises performed sequentially with minimal rest
 - A long-distance running session
 - An exclusively strength-based regimen

Ans :

FOREIGN 2010

- (b) A series of varied exercises performed sequentially with minimal rest

Circuit training involves performing a series of varied exercises sequentially with minimal rest between them. This method targets multiple fitness components simultaneously, including strength, endurance, flexibility, and coordination, offering a comprehensive workout that maximizes training efficiency and overall athletic performance.

- 53.** What is a primary benefit of circuit training for athletes?
- Only improved flexibility
 - Simultaneous development of strength, endurance, and coordination
 - Increased sedentary behavior
 - Isolated muscle group training

Ans :

SQP 2015

- (b) Simultaneous development of strength, endurance, and coordination

Circuit training offers the primary benefit of developing multiple fitness components simultaneously. It enhances strength, endurance, flexibility, and coordination by combining varied exercises in a continuous format. This comprehensive approach maximizes workout efficiency and contributes significantly to overall athletic performance.

- 54.** Which factor is critical in talent identification within sports?

- Random selection
- Consistent performance evaluation
- Social media popularity
- Age alone

Ans :

COMP 2018

- (b) Consistent performance evaluation

Consistent performance evaluation is critical in talent identification as it systematically assesses athletes' physical, technical, and psychological abilities. This rigorous process helps distinguish individuals with high potential, enabling coaches to focus on those most likely to succeed through targeted training and development.

- 55.** Which psychological factor is essential for effective talent development?

- Motivation
- Physical size only
- Financial background
- Luck

Ans :

DELHI 2009

- (a) Motivation

Motivation is essential for effective talent development as it drives athletes to persist, overcome challenges, and continually improve their skills. Intrinsic and extrinsic motivators work together to fuel commitment, ensuring that identified talents receive the necessary support and training to excel competitively.

- 56.** Why is periodization important in sports training?

- It randomizes training sessions
- It structures training into distinct phases for optimal adaptation
- It reduces performance
- It ignores recovery

Ans :

OD 2003

- (b) It structures training into distinct phases for optimal adaptation

Periodization is important because it structures training into distinct phases, such as micro, meso, and macro cycles, to optimize adaptation, prevent overtraining, and allow systematic progression. This strategic approach maximizes performance improvements and ensures athletes peak at critical competition times.

(c) A is true but R is false

The assertion is true because circuit training integrates various exercise modalities to target both strength and endurance. However, the reason is false as it inaccurately claims that circuit training neglects strength development, when in fact it typically includes strength exercises alongside cardiovascular work.

- 80. Assertion (A) :** Talent identification focuses on selecting individuals with innate potential, while talent development is the process of nurturing these selected individuals through systematic training.

Reason (R) : Talent development disregards an athlete's innate abilities and emphasizes only the skills acquired through training.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2019

(c) A is true but R is false

The assertion accurately distinguishes between talent identification and development. The reason is false because talent development builds upon innate abilities by refining and enhancing them through training rather than ignoring them, making the reason an incorrect explanation.

- 81. Assertion (A) :** The microcycle is the shortest phase—typically lasting one week—while mesocycles and macrocycles are structured over longer periods to plan training intensity, progression, and recovery.

Reason (R) : The microcycle is primarily designed to evaluate immediate performance responses, whereas macrocycles are used solely for recovery.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2014

(c) A is true but R is false

The assertion is correct as it outlines the hierarchical structure of training cycles. However, the reason is false because while the microcycle does gauge short-term responses, macrocycles

serve to plan long-term progression, not just recovery—they integrate periods of peak performance, competition, and rest.

- 82. Assertion (A) :** An integrated training approach that combines various methods within the training cycle fosters comprehensive development in strength, endurance, speed, flexibility, and coordination.

Reason (R) : Focusing on one physical attribute at a time is more effective than an integrated training regimen in producing overall athletic performance improvements.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2016

(c) A is true but R is false

The assertion is true since an integrated training approach addresses multiple fitness components, leading to balanced athletic development. The reason is false because specialization in only one attribute tends to neglect other critical areas; integrated training is generally more effective for overall performance.

- 83.** The process of discovering potential performers who are not currently involved in a particular sport is known as _____.

- (a) Talent Identification
- (b) Talent Development
- (c) Talent Transfer
- (d) Talent Detection

Ans :

SQP 2018

(d) Talent Detection

Talent Detection is the first stage, which is the discovery of potential performers not currently involved in the sport in question.

- 84.** A _____ is considered a training cycle of medium duration, typically lasting from 3 to 6 weeks.

- (a) Micro Cycle
- (b) Meso Cycle
- (c) Macro Cycle
- (d) Annual Plan

Ans :

COMP 2020

(b) Meso Cycle

63. Which exercise is key for improving balance in coordinative ability training?

- (a) Treadmill running
- (b) Balance board exercises
- (c) Heavy weightlifting
- (d) Static stretching

Ans :

SQP 2004

(b) Balance board exercises

Balance board exercises are key for improving balance by challenging an athlete's stability and engaging core muscles. Regular practice enhances neuromuscular coordination, reduces the risk of falls, and improves overall movement efficiency, making it crucial for sports requiring precise balance and coordination.

64. Which training technique integrates multiple fitness components in one session?

- (a) Continuous running
- (b) Circuit training
- (c) Isolated strength training
- (d) Static stretching

Ans :

COMP 2002

(b) Circuit training

Circuit training integrates various exercises targeting strength, endurance, flexibility, and coordination into one continuous session. With minimal rest between stations, it maximizes training efficiency, improves overall fitness, and replicates the diverse physical demands of sports in a time-effective, comprehensive workout format.

65. How does talent development differ from talent identification?

- (a) They are identical
- (b) Development nurtures potential; identification detects it
- (c) Identification involves coaching only
- (d) Development is unrelated to training

Ans :

FOREIGN 2011

(b) Development nurtures potential; identification detects it

Talent development differs from talent identification in that identification detects potential in athletes through evaluation, whereas development involves nurturing, refining, and enhancing that potential over time. This process ensures that promising athletes receive the structured support required to excel competitively.

66. Which factor most influences an athlete's adaptation to training?

- (a) Training load and recovery
- (b) Social media exposure
- (c) Random exercise selection
- (d) Uniform color

Ans :

DELHI 2013

(a) Training load and recovery

Training load and recovery are the most influential factors in an athlete's adaptation to training. Proper balance between intensity, volume, and rest enables physiological improvements, prevents overtraining, and ensures that the body effectively adapts to imposed demands, thereby enhancing overall performance.

67. What is the role of load progression in strength training?

- (a) It maintains constant intensity
- (b) It gradually increases resistance to stimulate adaptation
- (c) It reduces workout frequency
- (d) It eliminates muscle fatigue

Ans :

OD 2016

(b) It gradually increases resistance to stimulate adaptation

Load progression in strength training involves gradually increasing the resistance or intensity of workouts to continuously challenge muscles. This progressive overload stimulates adaptations, promotes strength gains, and prevents performance plateaus, ensuring that athletes steadily improve and achieve long-term fitness goals.

68. What does overtraining in sports refer to?

- (a) Adequate recovery between sessions
- (b) Excessive training without sufficient rest
- (c) Balanced workout routines
- (d) Minimal exercise frequency

Ans :

SQP 2020

(b) Excessive training without sufficient rest

Overtraining in sports refers to a condition where athletes train excessively without adequate recovery, leading to fatigue, performance decline, and increased injury risk. This imbalance between training stress and recovery disrupts physiological and psychological processes, ultimately hindering long-term athletic progress.

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69. What is the significance of active recovery in a training program?

- (a) It increases muscle soreness
- (b) It facilitates blood flow and speeds up recovery
- (c) It reduces training effectiveness
- (d) It is unrelated to performance

Ans :

COMP 2007

(b) It facilitates blood flow and speeds up recovery
Active recovery involves low-intensity exercise during rest periods to promote blood circulation, accelerate the removal of metabolic waste, and facilitate muscle repair. This approach minimizes soreness, supports overall recovery, and helps maintain fitness levels, thereby optimizing subsequent training sessions and performance.

70. Which phase of the training cycle focuses on achieving peak performance before competition?

- (a) Transition phase
- (b) Preparatory phase
- (c) Competition phase
- (d) Recovery phase

Ans :

FOREIGN 2003

(c) Competition phase

The competition phase of the training cycle is designed to achieve peak performance by tapering training intensity and fine-tuning skills before events. This phase prioritizes maximizing strength, speed, and endurance while minimizing fatigue, ensuring that athletes perform optimally during critical competitions.

71. Which method is used to develop speed-endurance in athletes?

- (a) Long, slow distance training
- (b) Sprint interval training
- (c) Static stretching
- (d) Heavy resistance training

Ans :

DELHI 2008

(b) Sprint interval training

Sprint interval training is used to develop speed-endurance by combining short, high-intensity sprints with recovery periods. This method improves both anaerobic and aerobic energy systems, enhancing an athlete's ability to sustain high-intensity efforts over time, which is critical for explosive sports performance.

72. Which principle is central to the effectiveness of circuit training?

- (a) Isolating muscle groups
- (b) Sequential multi-exercise structure with minimal rest
- (c) Extended rest periods
- (d) Focusing solely on aerobic exercises

Ans :

OD 2006

(b) Sequential multi-exercise structure with minimal rest

The central principle of circuit training is its sequential multi-exercise structure with minimal rest between exercises. This design allows simultaneous development of various fitness components, maximizes workout efficiency, and creates a comprehensive training session that improves strength, endurance, and overall athletic performance.

73. What role does flexibility play in injury prevention for athletes?

- (a) Increases injury risk
- (b) Enhances range of motion and reduces muscle stiffness
- (c) Decreases joint mobility
- (d) Has no significant impact

Ans :

SQP 2002

(b) Enhances range of motion and reduces muscle stiffness

Flexibility enhances an athlete's range of motion, reduces muscle stiffness, and improves joint mobility. These benefits help maintain proper movement patterns, reduce the risk of strains and sprains, and contribute to overall injury prevention, thereby supporting sustained athletic performance and long-term health.

74. How does coordinative ability contribute to overall sports performance?

- (a) It solely increases muscle mass
- (b) It improves movement synchronization, balance, and agility
- (c) It reduces reaction time
- (d) It has no effect on performance

Ans :

COMP 2010

(b) It improves movement synchronization, balance, and agility

Coordinative ability contributes to overall sports performance by enhancing the synchronization of body movements, balance, and agility. Improved coordination enables athletes to execute complex maneuvers smoothly, respond quickly to changing situations, and maintain control, ultimately

leading to superior performance in competitive sports.

- 75. Assertion (A) :** Talent identification is essential in sports as it helps recognize potential athletes early on.

Reason (R) : Early identification allows for tailored training programs and resource allocation, ensuring that innate abilities are systematically nurtured over time.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2012

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is correct because identifying talent early lays the foundation for future success. The reason is also accurate, as it explains that early recognition enables coaches to design specific training and allocate resources efficiently, making it the correct explanation for the assertion.

- 76. Assertion (A) :** A well-structured training cycle includes micro, meso, and macro cycles to optimize performance progression over time.

Reason (R) : The macrocycle is the shortest phase in the training cycle, focusing on immediate performance improvements.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2005

- (c) A is true but R is false

The assertion is true, as a training cycle is indeed divided into micro, meso, and macro phases. However, the reason is false because the macrocycle is the longest phase that spans an entire season or year, not the shortest phase dedicated to immediate performance.

- 77. Assertion (A) :** Utilizing distinct methods such as resistance training for strength, interval training for endurance, and sprint drills for speed is critical for athletic performance.

Reason (R) : These training methods are interchangeable, meaning improvement in one

physical attribute automatically enhances the others.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2011

- (c) A is true but R is false

The assertion is accurate since specific methods are needed to target strength, endurance, and speed separately. The reason is false because these attributes require specialized training approaches; improvement in one does not automatically translate to gains in the others.

- 78. Assertion (A) :** Enhancing flexibility and coordinative ability requires dedicated training methods such as static stretching and skill-based drills.

Reason (R) : Improvements in flexibility inherently lead to better coordination in athletes.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2013

- (c) A is true but R is false

The assertion is correct because specific training (like stretching and drills) is needed to improve flexibility and coordination. The reason is false since enhanced flexibility does not automatically result in better coordination; coordination also depends on neuromuscular control and skill practice.

- 79. Assertion (A) :** Circuit training is a versatile method that combines strength and endurance exercises in a time-efficient manner.

Reason (R) : Circuit training focuses solely on cardiovascular improvement and neglects strength development.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2015

57. Which cycle in periodization consists of daily workouts and short-term planning?
- Macro cycle
 - Meso cycle
 - Micro cycle
 - Annual cycle

Ans :

FOREIGN 2012

- (c) Micro cycle

The micro cycle consists of daily workouts and short-term planning, typically lasting one week. It allows coaches to focus on immediate training objectives, monitor progress, and make necessary adjustments, forming the foundational building block for larger meso and macro cycles in the periodized plan.

58. What role does recovery play in a sports training cycle?
- Increases fatigue
 - Enhances adaptation and prevents overtraining
 - Hinders progress
 - Is irrelevant to training

Ans :

SQP 2019

(b) Enhances adaptation and prevents overtraining
Recovery plays a vital role by allowing the body to repair, adapt, and rebuild after training sessions. Adequate recovery prevents overtraining, reduces injury risk, and ensures that athletes can consistently perform at optimal levels while achieving long-term progress in their training regimen.

59. Which method is best suited for developing maximal strength?
- Endurance training
 - Heavy resistance training
 - Flexibility training
 - Aerobic exercise

Ans :

COMP 2001

- (b) Heavy resistance training

Heavy resistance training is best suited for developing maximal strength by applying high loads that stimulate muscle fiber recruitment and hypertrophy. This method effectively increases force production and muscular power, which are critical for performance in sports requiring explosive strength and high-intensity exertion.

60. Which method primarily improves muscular endurance?

- Low-weight, high-repetition resistance training
- High-intensity interval training
- Plyometric training
- Static stretching

Ans :

DELHI 2008

(a) Low-weight, high-repetition resistance training
Low-weight, high-repetition resistance training primarily improves muscular endurance by conditioning muscles to sustain prolonged activity. This approach enhances stamina, delays fatigue, and improves overall performance in sports requiring continuous muscle contraction over extended periods during competition.

61. Which training method is commonly used to improve speed and power?

- Long-distance running
- Sprint interval training
- Yoga
- Static stretching

Ans :

OD 2005

- (b) Sprint interval training

Sprint interval training is commonly used to improve speed and power by incorporating short, high-intensity sprints followed by recovery periods. This method enhances anaerobic capacity, muscle power, and neuromuscular efficiency, allowing athletes to achieve rapid acceleration and explosive performance during competitions.

- Which modality is effective for enhancing anaerobic power?

- Low-intensity cycling
- Sprint training and plyometrics
- Continuous jogging
- Dynamic stretching

Ans :

FOREIGN 2014

- (b) Sprint training and plyometrics

Sprint training combined with plyometric exercises is effective for enhancing anaerobic power. These high-intensity activities stimulate fast-twitch muscle fibers, improve explosive strength, and increase power output, essential for sports that require short, intense bursts of energy and rapid movement execution.

The duration of a Meso Cycle is 3 to 6 weeks and is termed a cycle of medium duration.

- 85.** Exercises where movement is visible and the muscle changes length against resistance, such as in weight training, are known as _____ exercises.

(a) isometric
(b) isokinetic
(c) isotonic
(d) static

Ans :

DELHI 2018

(c) isotonic

In Isotonic exercises movements can be seen directly and which result in toned muscles and increased muscle length.

- 86.** The ability of an individual to do various motor activities correctly and efficiently, which depends on the central nervous system, is called _____ abilities.

(a) conditional
(b) coordinative
(c) locomotive
(d) flexible

Ans :

OD 2020

(b) coordinative

Coordinative abilities enables an individual to do various activities correctly and efficiently, and states they primarily depend on the central nervous system.

- 87.** The method of developing speed that involves running a specified distance by attaining maximum speed from a static position is known as _____ runs.

(a) pace
(b) fartlek
(c) acceleration
(d) repetition

Ans :

SQP 2016

(c) acceleration

Acceleration is a method used to develop speed by having a sportsperson attain maximum speed from a static position over a specific distance.

- 88.** The ability to perform a movement with greater amplitude with the help of an external partner or force is called _____ flexibility.

(a) active
(b) dynamic

(c) static
(d) passive

Ans :

COMP 2014

(d) passive

Passive flexibility is defined as the ability to do movements with greater amplitude and with external help.

- 89.** The ability to determine and change the position and movements of the body in time and space is known as _____ ability.

(a) Coupling
(b) Orientation
(c) Adaptation
(d) Rhythm

Ans :

OD 2019

(b) Orientation

Ability to determine and change the position and movements of the body in the required time and available space.

- 90.** Match the training cycle in List-I with its correct duration in List-II.

List-I (Training Cycle)			List-II (Duration)
(a)	Micro Cycle	(i)	3 to 6 weeks
(b)	Meso Cycle	(ii)	3 to 12 months
(c)	Macro Cycle	(iii)	3 to 10 days
(d)	Sectional Plan	(iv)	Can refer to a period, phase, or week of training

Select the correct option from the following:

(A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(B) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
(C) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
(D) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

Ans :

DELHI 2015

(D) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

A Micro Cycle is the shortest, lasting 3 to 10 days. A Meso Cycle is of medium duration, from 3 to 6 weeks. A Macro Cycle is the longest, from 3 to 12 months. Sectional plans are plans of phases, periods, and weeks.

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repetition.

The interval training method follows the "effort and recovery" principle. The training load can be adjusted by either extending the effort period or shortening the recovery period. This method is particularly effective for enhancing endurance in track runners, as it allows for adaptation to high-intensity bursts while ensuring efficient recovery.

- 125.** What do you understand by relative strength? Explain the importance of body weight in determining relative strength.

Ans :

Delhi 2015

Relative strength refers to the strength an athlete possesses in proportion to their body weight. It plays a crucial role in sports where athletes must move their body through space without additional external weight, such as high jump and long jump, as well as in sports where maintaining a specific weight category is essential, such as boxing and wrestling.

1. It enhances performance across various sports by maximizing motor unit recruitment and improving neuromuscular efficiency.
2. When an athlete maintains strength while keeping their body weight low, relative strength remains high, leading to improved efficiency and performance.

- 126.** Dynamic strength is divided into three parts. Write in brief about each.

Ans :

AI 2015

Dynamic Strength refers to the ability of muscles to exert force while undergoing movement. It is crucial for various sports and is divided into three types:

1. **Maximum Strength:**
 - i. It is the highest force an athlete can generate in a single movement.
 - ii. Essential for power-based sports such as weightlifting and shot put.
 - iii. Requires short bursts of effort with heavy resistance.
2. **Explosive Strength:**
 - i. The ability to exert force quickly in a short time span.
 - ii. Crucial for activities like high jump, long jump, sprinting, and volleyball spiking.
 - iii. Helps in sudden acceleration and quick bursts of power.
3. **Strength Endurance:**

- i. The capacity to sustain muscular contractions over a prolonged period.
- ii. Important in sports like rowing, cycling, swimming, and long-distance running.
- iii. Improves stamina and resistance to fatigue during extended physical activity.

- 127.** Elucidate any two types of coordinative ability with suitable examples.

Ans :

Term-II, 2021-22

1. **Orientation Ability:** This coordinative ability allows an individual to determine their body position and movement in response to a moving object. It relies on sensory inputs such as vision and kinesthetic awareness. This ability is crucial in sports like basketball, football, volleyball, and table tennis, where athletes must react quickly to a moving ball or opponent.
2. **Coupling Ability:** This refers to the coordination of different body parts to execute smooth and efficient movements in sports. It enables athletes to synchronize their limbs and body movements to perform complex actions effectively. It is prominently seen in sports such as boxing and wrestling, where precise control of multiple body parts is necessary for success.

- 128.** Define Circuit Training. Draw a diagram of 8 (Eight) stations and explain its advantages.

Ans :

Delhi 2019

Circuit training is a form of body conditioning that involves performing a series of exercises in succession. It can be designed to enhance strength and aerobic fitness. Typically, a circuit consists of 8 to 15 exercise stations, with designated rest periods between exercises.

Advantages of Circuit Training:

1. It can be structured to provide a full-body workout.
2. Easily adaptable to suit the age, fitness level, and health of the individual.
3. Suitable for large group training sessions.
4. Enables trainees to achieve effective results in a short time.
5. Allows the coach to monitor and supervise training efficiently.
6. Ideal for individuals with limited time for regular exercise.
7. Can be conducted both indoors and outdoors.

94. Match the flexibility method in List-I with its description in List-II.

	List-I (Method)		List-II (Description)
(a)	Slow Stretch and Hold	(i)	Performing movement with a swing and rhythm, using momentum.
(b)	Ballistic Method	(ii)	Stretching with the help of an external force, like a partner.
(c)	PNF Technique	(iii)	Holding a stretch at the point of maximum extension for 6-8 seconds.
(d)	Passive Flexibility	(iv)	Contracting a muscle maximally for a few seconds before gradually stretching it.

Select the correct option from the following:

- (A) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
 (B) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
 (C) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
 (D) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

Ans :

FOREIGN 2010

- (B) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

The Slow Stretch and Hold method involves holding a stretch at its maximum point. The Ballistic method uses swing and rhythm. The PNF technique involves contracting a muscle before stretching it. Passive flexibility involves using an external partner or force.

TWO MARKS QUESTIONS

95. Comment on the concept of Talent Identification and Talent Development.

Ans :

2024

Talent identification can be described as “the process by which children are guided to participate in the sport where they have the highest likelihood of success, based on specific criteria that predict their performance potential, considering their current fitness and maturity levels.”

It is important to distinguish talent identification

from latent development. Identification is the initial step in the progression from a beginner to a successful international athlete, with talent development following as the next essential phase in achieving sporting excellence.

96. Explain the term ‘Sports Training.’

Ans :

OD 2018

Sports training is the preparatory process an athlete undertakes to reach a specific goal. It involves a systematic and technical approach designed to optimize performance and help the athlete achieve their highest potential.

97. Which method will you suggest to develop endurance?

Ans :

AI 2019

The Fartlek method is an effective way to develop endurance, as it seamlessly integrates continuous training with the benefits of interval training.

98. What is Endurance? How endurance can be developed through Fartlek method?

Ans :

Delhi 2016

Endurance fitness is the capacity to maintain the required activity level in a specific competitive sport. It encompasses both cardiovascular and muscular endurance, making it a fundamental component of overall fitness. Endurance is crucial for success in many sports, such as distance running and triathlon. In sports like football, having high endurance is equally important as it contributes significantly to an athlete's overall performance profile. In essence, endurance can be defined as:

1. The ability to sustain an activity
2. The ability to resist fatigue
3. The capacity that can be measured by the number of repetitions of an activity

99. Define flexibility and its types.

Ans :

DELHI 2020

Flexibility refers to the ability of a joint or muscle to move freely through its complete range of motion. There are two main types of flexibility:

1. Active Flexibility: This is achieved when an individual uses their own muscle strength to move a joint through its full range of motion without any external assistance.
2. Passive Flexibility: This type occurs when an external force—such as gravity, a partner, or a stretching aid—helps move a joint beyond

91. Match the type of strength in List-I with its correct sporting example in List-II.

	List-I (Type of Strength)		List-II (Sporting Example)
(a)	Maximum Strength	(i)	Volleyball spiking
(b)	Explosive Strength	(ii)	Long-distance swimming
(c)	Strength Endurance	(iii)	Weightlifting
(d)	Static Strength	(iv)	Holding a plank or a yoga asana

Select the correct option from the following:

- (A) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 (B) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
 (C) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
 (D) (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)

Ans :

FOREIGN 2013

- (A) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

Maximum strength is needed in sports like weightlifting. Explosive strength (strength + speed) is used for actions like volleyball spiking. Strength endurance is for resisting fatigue in events like long-distance swimming. Static strength involves muscle tension without movement, like in a plank.

92. Match the endurance training method in List-I with its key characteristic in List-II.

	List-I (Method)		List-II (Characteristic)
(a)	Fartlek Method	(i)	Based on the principle of work followed by incomplete recovery
(b)	Interval Method	(ii)	A Swedish term for 'speed play' with unplanned pace changes
(c)	Repetition Method	(iii)	Long, non-stop exercise with a heart rate between 140-160 bpm
(d)	Slow Continuous Method	(iv)	High intensity (90-100%) work followed by complete recovery

Select the correct option from the following:

- (A) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 (B) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (C) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
 (D) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Ans :

SQP 2011

- (D) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Fartlek is Swedish for 'speed play' with unplanned changes in pace. The Interval Method uses work periods followed by incomplete recovery. The Repetition Method uses very high intensity with complete recovery intervals. The Slow Continuous Method involves long, steady work at a heart rate of 140-160 bpm.

93. Match the type of speed ability in List-I with its correct definition in List-II.

	List-I (Speed Ability)		List-II (Definition)
(a)	Reaction Ability	(i)	The ability to achieve high speed from a stationary position.
(b)	Acceleration Ability	(ii)	The ability to maintain maximum speed for a maximum duration.
(c)	Locomotor Ability	(iii)	The ability to react quickly and effectively to a stimulus.
(d)	Speed Endurance	(iv)	The ability to perform movements with high speed under conditions of fatigue.

Select the correct option from the following:

- (A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (B) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
 (C) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 (D) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

Ans :

COMP 2005

- (C) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)

Reaction ability is reacting to a stimulus. Acceleration ability is achieving high speed from a stationary position. Locomotor ability is maintaining maximum speed. Speed endurance is maintaining high speed while fatigued.

107. What are meso cycles and macro cycles in the context of sports training?

Ans :

OD 2003

1. Meso Cycle: A meso cycle is an intermediate training phase, usually lasting several weeks to a few months. It integrates multiple micro cycles to focus on specific fitness components (e.g., strength, endurance, or speed) and periodizes training to prepare for competitions.
2. Macro Cycle: A macro cycle is the overall training plan for an entire season or year, encompassing several meso cycles. It outlines long-term goals, peak performance periods, and the transition between different phases of training and competition.

108. How do the various cycles (micro, meso, macro) work together in an effective training program?

Ans :

DELHI 2007

1. Integration:
 - i. Micro cycles provide daily and weekly structure to ensure specific, targeted training sessions and recovery.
 - ii. Meso cycles build upon micro cycles to focus on particular performance attributes, allowing for systematic progress and adaptation over weeks.
 - iii. Macro cycles integrate all phases over the long term, ensuring that training peaks at the right time for key competitions.
2. Outcome: This periodized approach helps manage workload, minimizes injury risk, and ensures continuous improvement while aligning training with competitive schedules.

109. List and explain two types of training methods used to develop strength in athletes.

Ans :

SQP 2004

1. Resistance Training: Involves using weights, machines, or body weight to create muscular overload, leading to muscle hypertrophy and increased strength.
2. Plyometric Training: Focuses on explosive movements such as jumps and bounds that improve muscular power and neuromuscular coordination, essential for dynamic strength.

110. Describe two methods to develop endurance in sports.

Ans :

COMP 2001

1. Continuous Training: Involves sustained, steady-state exercise (e.g., long-distance running, cycling) to improve aerobic capacity and stamina.
2. Interval Training: Combines periods of high-intensity exercise with rest or low-intensity recovery, enhancing both aerobic and anaerobic endurance by challenging the cardiovascular system and improving recovery rates.

111. How can speed be developed through training? Provide one method and its benefits.

Ans :

FOREIGN 2009

1. Method – Sprint Interval Training: Involves short, high-intensity sprints followed by recovery periods.
2. Benefits: This method improves neuromuscular coordination, increases anaerobic capacity, and enhances the efficiency of fast-twitch muscle fibers, leading to quicker acceleration and improved overall speed.

112. What are some key components of strength, endurance, and speed that coaches must target in training programs?

Ans :

OD 2017

1. Strength: Focus on muscle hypertrophy, power output, and neural adaptations through progressive overload and varied resistance exercises.
2. Endurance: Emphasize aerobic capacity, lactate threshold, and efficient energy metabolism using continuous and interval training.
3. Speed: Target rapid force production, agility, and explosive power, often through sprint drills, plyometrics, and technique refinement.

113. Explain the role of periodization in developing strength, endurance, and speed throughout a training cycle.

Ans :

DELHI 2015

1. Role of Periodization: It involves planning training phases to focus on different fitness components at optimal times. For example, an athlete may begin with a general preparation phase to build endurance, followed by a strength phase, and finally a power and speed phase as competitions approach.
2. Outcome: This systematic variation prevents plateaus, minimizes overtraining, and ensures

the range that the individual can achieve on their own.

100. Suggest any two methods to improve flexibility.

Ans :

Delhi 2019

Methods to enhance flexibility include:

1. Stretch and Hold Method: Involves holding a stretch to gradually lengthen muscles.
2. Dynamic Stretching Method: Uses controlled, active movements to increase range of motion.
3. Ballistic Method: Often applied in activities such as yoga or dance, involving bouncing movements to push the limits of flexibility.
4. Proprioceptive Neuromuscular Facilitation (PNF) Techniques: Involves partner-assisted exercises or the use of equipment to improve flexibility through controlled stretching and muscle contraction.

101. Explain Isokinetic exercise with suitable examples.

Ans :

2023-24

This method was introduced by J.J. Perrine in 1968 and utilizes a specific type of muscle contraction known as isokinetic contraction. It is primarily applied in sports such as rowing and swimming and is performed using specialized equipment. In isokinetic contraction, muscles exert maximal force continuously throughout the entire range of motion around a joint. In contrast, during isotonic contraction, the force is applied at a specific angle. As a result, the use of isokinetic contraction remains relatively limited.

102. Define explosive strength with the help of example.

Ans :

Term-II, 2021-22

Explosive strength is the ability to overcome resistance rapidly and powerfully. It is critical for take-off events in sports, such as long jump, high jump, and triple jump, and plays a vital role in volleyball for smashing or spiking and in basketball for securing rebounds.

103. What are the salient features of the Fartlek training method?

Ans :

Term-II, 2021-22

Features of Fartlek Training:

1. This training is typically performed on hilly terrain, though it can also take place in environments such as forests, along riverbeds, or on muddy roads.
2. It is commonly utilized as an off-season training method.

3. A high degree of self-discipline is essential for success in this type of training.
4. It has been proven to be one of the best methods for improving endurance in sports where endurance is a fundamental requirement.

104. Define talent identification and explain its significance in sports.

Ans :

SQP 2002

1. Definition: Talent identification is the systematic process of recognizing individuals who demonstrate the potential to excel in a specific sport. This involves assessing physical, technical, psychological, and cognitive attributes at an early age.
2. Significance: Early identification helps in channeling the right resources, coaching, and training to nurture potential. It ensures that athletes receive specialized development programs to maximize their performance and prolong their sporting careers.

105. What is talent development in sports, and how does it differ from talent identification?

Ans :

COMP 2006

1. Definition: Talent development refers to the ongoing process of improving an athlete's skills, physical abilities, and psychological resilience through structured training, coaching, and competitive exposure.
2. Difference: While talent identification is about spotting potential, talent development focuses on refining and enhancing that potential into high-level performance through continuous, systematic training.

106. Introduce the concept of the sports training cycle and explain what a micro cycle is.

Ans :

FOREIGN 2008

1. Training Cycle Concept: A sports training cycle is a periodized plan that structures training into different phases to optimize performance, prevent overtraining, and promote gradual improvements.
2. Micro Cycle: A micro cycle is the shortest training cycle, typically lasting a week, where daily workouts are planned to target specific skills or physical components. It allows coaches to adjust training loads, recovery, and technique work on a short-term basis.

- 121.** Describe how circuit training can be modified to target different aspects of fitness (strength, endurance, flexibility, and coordination) and explain its overall importance in sports training.

Ans :

COMP 2012

1. Modification:
 - i. Strength Stations: Use resistance exercises like push-ups, squats, or weightlifting.
 - ii. Endurance Stations: Include aerobic exercises such as jump rope, running in place, or cycling sprints.
 - iii. Flexibility Stations: Incorporate dynamic stretches or yoga poses that promote mobility.
 - iv. Coordination Stations: Utilize agility drills or balance exercises like ladder drills or stability ball work.
2. Overall Importance: Circuit training's versatility allows athletes to address multiple fitness components in a single session, improves overall conditioning, maintains an elevated heart rate for cardiovascular benefits, and keeps training sessions engaging and time-efficient.

- i. Repetitions should last from 30 seconds up to 2–3 minutes, unlike the 5–10 seconds typical of speed drills.
- ii. Rest intervals between repetitions are reduced to prevent complete recovery.

- 123.** What is Fartlek training? Write in brief.

Ans :

Delhi 2017

Fartlek training consists of continuous exercise in which the intensity and type of activity are varied. For instance, during a running session, an athlete might alternate between sprinting for 10 seconds, fast walking for 20 seconds, and jogging for 1 minute, with this cycle repeated. Additional variations can include running uphill or on sand.

Advantages of Fartlek Training:

1. Although primarily used as an off-season training method, it is highly effective for developing endurance in athletes.
2. It offers a psychological edge over other training methods, as the changing environments help delay fatigue by keeping the workout engaging.
3. It is considered one of the best methods to improve endurance, particularly in sports like cross-country running, where sustained stamina is essential.

- 124.** Differentiate between 1 : 1 and 1 : 2 ratio interval training, with suitable examples.

Ans :

AI 2015

In interval training, a 1:1 ratio signifies that the duration of exercise and rest are equal. For instance, 1 minute of exercise is followed by 1 minute of rest. Similarly, a 1:2 ratio indicates that the rest period is twice as long as the exercise period, such as 1 minute of exercise followed by 2 minutes of rest.

Intervals consist of high-intensity exercise periods alternated with rest or low-intensity recovery phases.

For example, in a 1:1 ratio, an athlete might run 100 meters at 85% intensity, followed by 100 meters at 50% intensity to recover. This constitutes one repetition, and a set may include 5 to 10 repetitions. During this type of training, the heart rate can increase to 180 beats per minute and then decrease to 120-130 beats per minute during the recovery phase.

Similarly, in a 1:2 ratio, an athlete may sprint 100 meters at high intensity, then jog 200 meters at low intensity for recovery, completing one

THREE MARKS QUESTIONS

- 122.** What is movement speed? Explain the methods to develop speed endurance.

Ans :

Delhi 2015

1. Movement Speed : Movement speed is the ability to perform a skill—such as a tennis serve, kicking a ball, or hitting a baseball—quickly. It relies heavily on coordination, which is essential for mastering specific sport movements or techniques correctly. This speed is measured by the time taken to complete a particular movement.
2. Speed Endurance : Speed endurance refers to the capacity to execute movements at high speed even when fatigued. This ability depends on proper technique, local muscular endurance, and lactic acid tolerance. While both submaximal aerobic exercise and interval training improve the body's lactate buffering and tolerance, only intense interval training enhances key components of anaerobic power and capacity.

peak performance at critical competitions.

- 114.** Define flexibility and explain its importance in sports performance.

Ans :

OD 2010

1. Definition: Flexibility is the ability of a joint or series of joints to move through an unrestricted, pain-free range of motion.
2. Importance: Good flexibility enhances performance by improving movement efficiency, reducing the risk of injuries, and facilitating better technique in sports requiring agility and fluidity, such as gymnastics, dance, or martial arts.

- 115.** List two methods used to develop flexibility in athletes and explain how each works.

Ans :

SQP 2007

1. Static Stretching: Involves holding a stretch for 15–60 seconds to lengthen the muscle fibers gradually, improving overall range of motion.
2. Dynamic Stretching: Consists of controlled movements that take joints and muscles through their full range of motion, preparing the body for the demands of the sport while enhancing flexibility and blood flow.

- 116.** What is coordinative ability, and why is it important for sports?

Ans :

COMP 2017

1. Definition: Coordinative ability is the skill with which an athlete can organize body movements effectively, integrating balance, timing, rhythm, and spatial orientation.
2. Importance: This ability is crucial in sports that require precise, complex movements (e.g., soccer, basketball, and gymnastics). Improved coordination enhances performance, reduces the risk of injury, and enables athletes to perform techniques with higher efficiency and consistency.

- 117.** Identify two methods to develop coordinative ability in sports training.

Ans :

FOREIGN 2001

1. Agility Drills: Exercises such as ladder drills, cone drills, and shuttle runs improve quick directional changes and overall coordination.
2. Balance Training: Activities using balance boards or stability exercises improve

proprioception and neuromuscular control, key for coordinated movements in dynamic sports environments.

- 118.** Define circuit training and explain its importance in a well-rounded sports training program.

Ans :

DELHI 2018

1. Definition: Circuit training is a training method that involves a series of exercise stations performed consecutively with minimal rest in between. Each station targets different muscle groups or fitness components (strength, endurance, flexibility, and coordination).
2. Importance: This method provides a comprehensive workout by combining cardiovascular and resistance training, improves overall fitness, enhances recovery by maintaining an elevated heart rate, and prevents monotony in training sessions.

- 119.** How does talent identification contribute to long-term success in sports?

Ans :

OD 2020

1. Early talent identification allows coaches and organizations to tailor development programs that nurture specific skills and physical attributes.
2. It ensures that resources are allocated efficiently to athletes with the highest potential, providing them with specialized coaching, competitive opportunities, and developmental support, ultimately leading to sustained high performance.

- 120.** Discuss the advantages of using a periodized training cycle (micro, meso, macro) in athlete development.

Ans :

SQP 2019

Advantages:

1. Optimized Performance: Periodization helps in timing peak performance for major competitions by systematically varying training intensity and volume.
2. Injury Prevention: Alternating phases of intense training with recovery reduces the risk of overuse injuries.
3. Continuous Progress: Structured cycles allow for gradual improvement in fitness components such as strength, endurance, speed, and flexibility, while preventing plateaus in performance.

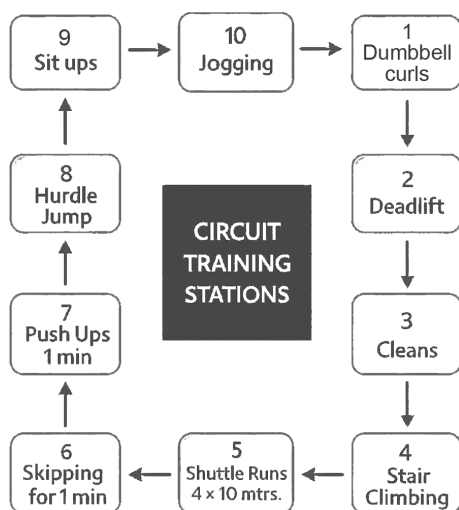
8. Requires minimal equipment, making it accessible.
9. Cost-effective, as it does not require expensive facilities.

129. What is circuit training ? Draw a diagram of 10 stations to improve general fitness. How can load be increased in circuit training ?

Ans :

OD 2018

Circuit training is a training method where a variety of exercises are performed sequentially, with or without equipment, following a prescribed intensity and duration. It is designed to enhance strength, endurance, and overall fitness by engaging different muscle groups in a structured format.



Ways to increase the load in circuit training :

1. Increasing the number of repetitions per exercise to enhance muscular endurance and strength.
2. Increasing the frequency of training sessions to improve overall fitness levels.
3. Adding external resistance or load (e.g., weights or resistance bands) to intensify the workout.
4. Reducing rest intervals between exercises to enhance cardiovascular endurance and muscular fatigue resistance.
5. Increasing the number of rounds in a circuit to extend workout duration and overall intensity.

130. What is the meaning of the Isotonic method and it is used for developing which ability?

Ans :

Term-II, 2021-22

Isotonic exercises were introduced by De Lorene in 1954. The term originates from the Greek word 'iso', meaning 'same or equal', referring to maintaining consistent muscle tone or tension. In isotonic exercises, one muscle group contracts while the opposing muscle group relaxes, resulting in a change in muscle length.

These exercises involve visible movements that can be observed by others. Rapid movements in isotonic exercises occur due to the reflexive alternation of contraction and relaxation between opposing muscle groups, particularly flexors and extensors around the joints.

Isotonic contraction refers to movements that involve shifting objects, such as lifting light weights or using dumbbells. Most strength-training exercises fall under this category, making isotonic exercises an effective method for developing muscular strength.

131. Define flexibility along with its types. Explain any two methods used to develop flexibility.

Ans :

2022-23

Flexibility is specific to each movement or joint, and its degree can vary throughout the body. It primarily refers to the range of motion at a particular joint and how far it can move efficiently. Types of Flexibility:

1. Active Flexibility: The ability to perform movements for an extended period without relying on external support. This type of flexibility depends entirely on muscular strength and control.
2. Passive Flexibility:
 - i. Static-Passive Flexibility (also referred to as passive flexibility) is the ability to reach and maintain extended positions using external support, such as body weight, limbs, or an external aid like a chair.
 - ii. Unlike static-active flexibility, where muscle control is solely responsible for holding the position, passive flexibility allows for greater range of motion due to external assistance.

132. Define talent identification and talent development in sports. How do these concepts contribute to building elite athletes?

Ans :

FOREIGN 2003

1. Talent Identification (TI) is the process of recognizing individuals with potential

athletic abilities and skills at an early age. It involves assessing physical, physiological, psychological, and technical attributes through tests and observations.

2. Talent Development (TD) is the structured process of nurturing and enhancing an identified athlete's abilities through systematic training, coaching, and competition exposure to maximize their performance over time.
3. Contribution to Elite Athletes:
 - i. TI ensures that individuals with high potential are discovered early and placed in appropriate training programs.
 - ii. TD refines their skills, strength, endurance, and tactical knowledge to reach peak performance.
 - iii. Long-term athlete development (LTAD) models help optimize training loads, recovery, and skill progression to prevent burnout and injuries.

133. What is a sports training cycle? Briefly describe the Micro, Meso, and Macro Cycles in athletic training.

Ans : DELHI 2009

A sports training cycle is a structured periodization approach that organizes training into systematic phases to optimize performance. It consists of three levels:

1. Micro Cycle (Short-Term Cycle):
 - i. Lasts 1 to 7 days (typically a week).
 - ii. Focuses on daily training sessions aimed at specific short-term goals.
 - iii. Example: A football team training for a weekly league match.
2. Meso Cycle (Mid-Term Cycle):
 - i. Lasts 2 weeks to a few months (4–6 weeks is common).
 - ii. Contains multiple micro cycles and targets skill development, strength building, or endurance improvement.
 - iii. Example: A swimmer preparing for a state championship in a 6-week training phase.
3. Macro Cycle (Long-Term Cycle):
 - i. Spans 6 months to a year or more.
 - ii. Includes multiple meso cycles, with distinct preparatory, competition, and recovery phases.
 - iii. Example: An Olympic sprinter following a yearly training program leading up to the Games.

134. Explain the different types of strength and mention one training method to develop each type.

Ans : SQP 2001

Types of Strength:

1. Maximum Strength: The greatest force an athlete can exert in a single effort.
Method: Weight Training (e.g., heavy squats for powerlifters).
2. Explosive Strength (Power): The ability to exert force quickly.
Method: Plyometric Training (e.g., box jumps for sprinters).
3. Endurance Strength: The ability to sustain muscle contractions over an extended period.
Method: Circuit Training (e.g., push-ups and lunges in a timed routine for wrestlers).

135. (a) What are the main types of endurance in sports training?

(b) How can interval training improve endurance?

Ans : COMP 2008

(a) Types of Endurance:

- i. Short-Term Endurance: (30 sec – 2 min)
Useful in sprinting and swimming.
- ii. Medium-Term Endurance: (2–10 min)
Important for middle-distance runners.
- iii. Long-Term Endurance: (10 min or more)
Crucial for marathon running and cycling.

(b) Interval Training for Endurance:

- i. Interval training involves alternating between high-intensity and low-intensity phases. Example: A runner sprints for 1 minute, then jogs for 2 minutes.
- ii. Increases aerobic and anaerobic capacity.
- iii. Enhances heart and lung efficiency.
- iv. Improves muscle recovery and stamina.
- v. Athletes use this method to boost endurance for long-duration sports.

136. What is circuit training? Explain its importance in sports training.

Ans : FOREIGN 2005

Circuit Training is a workout method where athletes perform multiple exercises in a sequence, targeting different muscle groups with minimal rest.

Importance in Sports Training:

1. Enhances Strength and Endurance: Combines resistance and cardio exercises.
2. Improves Agility and Coordination: Helps

- athletes develop speed, balance, and control.
3. Efficient Workout: Allows full-body conditioning in a short time.
 4. Prevents Boredom: Variety keeps training engaging.

137. What are the key differences between aerobic and anaerobic endurance training? Provide one example of each.

Ans :

DELHI 2014

1. Aerobic Endurance:
 - i. Requires oxygen for sustained energy production.
 - ii. Used in long-duration, low-intensity activities.
 - iii. Example: Marathon running relies on oxygen supply for energy.
2. Anaerobic Endurance:
 - i. Involves short bursts of high-intensity activity without relying on oxygen.
 - ii. Used in short sprints and explosive movements.
 - iii. Example: 100 m sprint where quick energy is derived from stored ATP and glycogen.

138. List three training methods to develop speed in athletes and explain one in detail.

Ans :

OD 2016

1. Sprint Training: Repeated short-distance sprints with rest.
2. Resistance Training: Sprinting with resistance (e.g., sled runs).
3. Acceleration Drills: Practicing fast starts and reaction times.

Sprint Training

- i. Athletes perform 10–40 m sprints at maximum effort.
- ii. Rest periods allow recovery while maintaining high intensity.
- iii. Improves fast-twitch muscle fiber activation for quicker acceleration.
- iv. Sprint training is essential for sports like football, track events, and basketball.

139. What are the different types of flexibility, and how can static stretching help improve it?

Ans :

SQP 2013

1. Types of Flexibility:
 - i. Static Flexibility: Holding a position to stretch muscles (e.g., toe touch).
 - ii. Dynamic Flexibility: Stretching through

movement (e.g., arm swings).

2. Static Stretching Benefits:
 - i. Enhances muscle elasticity and range of motion.
 - ii. Reduces risk of injuries and stiffness.
 - iii. Helps in post-workout recovery.
 - iv. Athletes use static stretching in cool-downs to maintain flexibility.

140. (a) What are the key components of coordinative ability?

(b) How does agility ladder training improve coordination in sports?

Ans :

COMP 2002

- (a) Components of Coordinative Ability:
 - i. Balance: Maintaining control during movement.
 - ii. Reaction Time: Quick response to stimuli.
 - iii. Rhythm: Smooth movement transitions.
- (b) Agility Ladder Training for Coordination:
 - i. Improves foot speed and balance.
 - ii. Enhances neural-muscular coordination for quick movements.
 - iii. Essential for sports like football and tennis.

141. What is talent identification in sports? Explain the five-stage process of talent identification and development.

Ans :

FOREIGN 2011

Talent identification is defined as “the process by which children are encouraged to participate in the sport they are most likely to succeed, based on selected parameters”. It is the first step in progressing from a beginner to a successful international athlete.

The process is classified into five stages:

1. Talent Detection: The discovery of potential performers who are not currently involved in the specific sport.
2. Talent Identification: Recognizing participants at an early age who have the potential to become elite performers in the future.
3. Talent Development: Providing athletes with a suitable learning environment to accelerate and realize their potential.
4. Talent Selection: The ongoing process of identifying individuals who demonstrate prerequisite performance levels at various stages of development.
5. Talent Transfer: Focusing on moving an athlete from one sport to another where they

160. What is active and passive flexibility?**Ans :**

Term-II, 2021-22

Flexibility can be categorized into active flexibility and passive flexibility, depending on whether external support is involved in maintaining a position.

1. **Active Flexibility:** Active flexibility refers to the ability to perform movements and maintain positions for an extended period without relying on external support. It is further divided into:
 - (i) **Dynamic Flexibility (Kinetic Flexibility):** This is the ability to execute dynamic movements using muscle power alone, bringing a limb through its full range of motion without any external assistance.
 - (ii) **Static-Active Flexibility (Active Flexibility):** This is the ability to assume and sustain an extended position solely using one's own muscle strength. It is commonly required in sports where athletes must hold positions for extended periods, such as racing car drivers. An example is lifting a leg and holding it high without any external support other than one's own leg muscles.
2. **Passive Flexibility:** Passive flexibility, also known as static-passive flexibility, is the ability to achieve and maintain an extended position with the help of external support, such as body weight, a partner, or an apparatus (e.g., a chair). Unlike static-active flexibility, passive flexibility does not solely depend on muscle strength to maintain the position.

161. Discuss the Concept of Talent Identification and Talent Development in Sports.**Ans :**

COMP 2012

1. **Talent Identification :** Talent identification is the systematic process of discovering athletes with the potential to excel in a sport. This process involves assessing physical attributes, technical skills, psychological traits, and sometimes even socio-cultural factors. Coaches and sports scientists use various screening methods, such as performance tests, physical assessments, and psychological evaluations, to identify young athletes who show exceptional promise. Early identification is crucial as it lays the groundwork for targeted training

programs that can nurture these natural abilities.

2. **Talent Development :** Once talent is identified, talent development takes center stage. This phase involves structured training, coaching, and support systems that aim to refine and enhance an athlete's abilities over time. Development programs are designed to be age-appropriate and progressive, focusing on technical skills, tactical understanding, and physical conditioning. A well-rounded talent development strategy also integrates mental conditioning, nutrition, and injury prevention. This holistic approach ensures that an athlete not only reaches their physical potential but also develops the psychological resilience necessary for high-pressure competitive environments.
3. **Integration and Importance :** The synergy between talent identification and talent development is essential for long-term success in sports. Early identification allows for the customization of training regimens that can be adjusted as the athlete grows and develops. Furthermore, continuous evaluation during the development phase ensures that the athlete's progress is tracked and that any necessary adjustments are made. The integration of these processes contributes to building a strong pipeline of elite athletes, which is vital for national and international competitive success. In summary, talent identification and development serve as the twin pillars of sports training, ensuring that promising individuals receive the support, resources, and opportunities needed to reach their highest potential.

162. Describe the Types & Methods to Develop Strength, Endurance, and Speed.**Ans :**

OD 2010

1. **Strength Development :** Strength training is a core component of athletic conditioning. It focuses on increasing the force-generating capacity of muscles through resistance exercises such as weightlifting, plyometrics, and isometric training. Progressive overload, which involves gradually increasing the resistance or load, is a key principle in strength development. This method improves muscle hypertrophy, neuromuscular efficiency, and overall power. Training programs are typically tailored to the sport-specific

1. Passive Flexibility is the ability to perform movements with a greater range of motion with external help, such as stretching with the assistance of a partner.
2. Active Flexibility is the ability to perform a movement with a greater range of motion without any external help, for example, performing a stretch by oneself.
3. Passive flexibility is always greater than active flexibility. The reason for this is that external help (like a partner or equipment) can gently push a joint beyond the range that the individual's own muscles can achieve through contraction alone. The difference between the two indicates a potential lack of muscular strength or coordination in the individual.

147. Explain any three types of coordinative abilities that are essential for sports performance, such as in team games or gymnastics.

Ans :

OD 2002

Coordinative abilities enable an individual to perform various activities correctly and efficiently by controlling and regulating motor actions. Three essential types are:

1. Orientation Ability: This is the ability to determine and change the position and movements of the body in time and space relative to a field of action (like a court) and moving objects (like a ball or opponent). It is crucial in team games like football for positioning and awareness.
2. Coupling Ability: This is the ability to coordinate the movements of different body parts with one another to achieve a goal-oriented whole-body movement. This is vital in sports with complex movements, like coordinating arm and leg movements during a gymnastic routine.
3. Rhythm Ability: This is the ability to perceive the rhythm of a movement and perform the action with the required rhythm. This is fundamental in sports like figure skating and gymnastics, where athletes must synchronize their movements to music or an internal tempo.

- 148.** (a) What are isometric and isotonic exercises?
 (b) Provide an example of each and explain their primary differences in terms of muscle action.

Ans :

DELHI 2013

- (a) Isometric exercises are static exercises where the muscle exerts force against resistance, but there is no visible change in the length of the muscle. Isotonic exercises are dynamic exercises in which movements can be seen directly, and the muscle changes length (either shortening or lengthening) against a constant resistance.
- (b) The primary difference is in the muscle action.
 - i. In an isometric exercise like pushing against a wall, the muscle creates tension but does not change its length, so no movement occurs.
 - ii. In an isotonic exercise like a bicep curl with a dumbbell, the muscle contracts and shortens (concentric contraction) to lift the weight and lengthens (eccentric contraction) to lower it, resulting in visible joint movement.

149. (a) Explain the continuous method for developing endurance.

- (b) Describe the difference between the 'slow continuous' and 'fast continuous' variations of this method.

Ans :

SQP 2011

- (a) The continuous method is a form of endurance training where an exercise is performed continuously for a long duration without any rest or break. Because the activity is non-stop, the intensity is generally kept low to medium, allowing the athlete to sustain the effort. The goal is to improve aerobic capacity by stressing the cardiovascular and respiratory systems over a prolonged period. This method is commonly used for activities like running, walking, cycling, and swimming.
- (b) The main difference between the two variations is the intensity of the exercise.
 - i. Slow Continuous Method: The activity is performed at a slow, steady speed for a long duration (typically over 30 minutes), with the heart rate maintained between 140-160 beats per minute.
 - ii. Fast Continuous Method: The activity is performed at a comparatively faster and uniform speed for a shorter duration (at least 20 minutes), with the heart rate elevated to between 160-180 beats per minute. This method is more strenuous.

may have more significant opportunities to succeed.

- 142.** Differentiate between a microcycle, mesocycle, and macrocycle in sports training.

Ans :

OD 2004

These three cycles are sectional plans that structure an athlete's training over different timeframes.

1. **Microcycle:** This is the shortest cycle, typically lasting 3 to 10 days. It is designed to manage training loads within a week, often balancing high-load days with medium or low-load days for active recovery.
2. **Mesocycle:** This is a medium-duration cycle, lasting from 3 to 6 weeks. Its purpose is to tackle specific training tasks like skill acquisition, development of motor fitness components, or preparation for a specific competition.
3. **Macrocycle:** This is the longest cycle, with a duration of 3 to 12 months. It encompasses several mesocycles and is designed to help an athlete improve their performance capacity to achieve an optimal level at a specific time, such as a major championship.

- 143.** Explain the three types of dynamic strength: Maximum Strength, Explosive Strength, and Strength Endurance, providing a sporting example for each.

Ans :

DELHI 2007

Dynamic strength, or isotonic strength, involves visible movements. It is divided into three parts:

1. **Maximum Strength:** This is the ability to overcome maximum resistance in a single muscular contraction. It is crucial in sports that require tackling heavy resistance, such as in weightlifting or the throwing events in athletics like shot put.
2. **Explosive Strength:** This is a combination of strength and speed, defined as the ability to overcome resistance as fast as possible. This type of strength is essential for quick, powerful movements like spiking in volleyball or performing jumps in basketball.
3. **Strength Endurance:** This is a combination of strength and endurance, defined as the ability to overcome resistance under conditions of fatigue for as long as possible. It is required in sports like long-distance swimming, rowing, and distance cycling.

- 144.** Describe the 'Fartlek' method of training for developing endurance. What are its major effects on an athlete?

Ans :

SQP 2003

The Fartlek method, a Swedish term meaning 'speed play,' is a variation of the continuous variable pace method for developing endurance. The key difference is that in Fartlek training, the changes in speed are not pre-planned. The athlete changes their pace of their own accord during the activity, often in response to the natural terrain, their surroundings, or their own feelings. The heart rate typically ranges between 140-180 beats per minute, and the training duration can be from 15 minutes to 1 hour.

Major effects of this method include improved speed and race tactics, enhanced mental and physical energy, better flexibility, and improved fast and slow-twitch muscle response. It is also excellent for getting into a racing mindset by mimicking the surges of speed found in a real race.

- 145.** What are the five different types of speed abilities that are important in sports? Briefly describe any three of them.

Ans :

COMP 2008

Speed is the ability to execute motor movements as quickly as possible. The five types of speed abilities are Reaction Ability, Acceleration Ability, Movement Speed, Locomotor Ability, and Speed Endurance.

1. **Reaction Ability:** This is the ability to react quickly and effectively to a stimulus or signal (e.g., a starter's gun). It is highly dependent on an individual's coordinative abilities.
2. **Acceleration Ability:** This is the ability to achieve a high speed of locomotion from a stationary or slow-moving position. It is greatly influenced by explosive strength and is crucial in sprinting events.
3. **Speed Endurance:** This is a combination of speed and endurance, representing the ability to perform movements at high speed under conditions of fatigue or for a longer duration. It is vital in events like the 400 m race.

- 146.** Differentiate between active and passive flexibility. Which type is always greater and why?

Ans :

FOREIGN 2006

Flexibility is the ability to execute a movement with a greater amplitude or range of motion around a joint.

1. **Aerobic Endurance:** This refers to the body's ability to sustain physical effort over an extended period when oxygen is sufficiently available. The heart rate typically ranges between 140 and 160 beats per minute during aerobic activities. Regular aerobic endurance training has a positive impact on overall health, improving cardiovascular efficiency and stamina.
2. **Anaerobic Endurance:** This is the ability to sustain high-intensity efforts for short durations under conditions where oxygen availability is limited. Anaerobic endurance is crucial for short bursts of intense activities like sprinting, weightlifting, and certain team sports.
3. **Classification Based on the Nature of Activity**
 - (a) **Basic Endurance (Aerobic Endurance):**
The ability to perform prolonged movements involving multiple muscle groups at a slow and steady pace. Common examples include walking and jogging, where oxygen supply is sufficient, allowing sustained effort.
 - (b) **Specific Endurance:**
This refers to an athlete's ability to resist fatigue in sport-specific conditions. The endurance demands of a 1500 m runner differ significantly from those of a wrestler, as each sport has unique endurance requirements. The better an athlete's sport-specific endurance, the more efficiently they can perform in that particular sport.
 - (c) **General Endurance:**
It is the body's overall ability to sustain endurance-based activities across different sports and to resist fatigue. Athletes with high general endurance can perform well in multiple endurance-based sports. For example, a 1500 m runner with high general endurance may perform well in a 10K race, though they might not match the level of specialized 10K runners who have trained specifically for long-distance endurance.
4. **Classification Based on the Duration of Activity**
 - (a) **Speed Endurance:**
The ability to maintain near-maximal speed for a prolonged period. During high-speed activities, lactic acid

accumulation disrupts muscle contraction, reducing force production and movement efficiency.

Speed-endurance training helps clear lactate more efficiently and delays fatigue, making it crucial for athletes who rely on sprinting or short-duration explosive movements.

(b) **Short-Term Endurance:**

This applies to sports or events lasting between 30 seconds and 2 minutes.

Training for short-term endurance often involves circuit training and other resistance-based workouts that improve muscular endurance within this time frame. Sports such as 400 m sprinting and short-distance swimming require this type of endurance.

(c) **Middle-Term Endurance:**

Essential for sports that require sustained effort for 2 to 11 minutes.

This endurance type depends on a combination of speed endurance and strength endurance to maintain performance.

Middle-distance runners (e.g., 1500 m races) rely heavily on this endurance category.

(d) **Long-Term Endurance:**

Needed for events lasting over 11 minutes, such as marathons, long-distance cycling, and triathlons.

Training focuses on low-intensity, prolonged efforts with minimal rest.

Light resistance loads may be incorporated to build endurance without causing excessive fatigue, and rest periods between exercises are minimized to sustain the effort.

- 153.** What do you mean by Interval Training and how endurance can be developed by this method?

Ans :

Delhi 2016 C

Interval Training : Interval training consists of alternating periods of high-intensity exercise with rest or low-intensity recovery phases. For example, an athlete might sprint 100 meters at 85% intensity, then jog 200 meters at 50% intensity to recover. This forms one repetition, and a set typically includes 5 to 10 such repetitions. During intense effort, the heart rate can rise to 180 beats per minute and then drop to 120-130 beats per minute during recovery.

This training method follows the "effort and recovery" principle, where the training load can be adjusted by either increasing the intensity period or reducing the recovery duration. It is particularly effective for enhancing endurance in track runners.

1. Advantages:
 - i. Integrates both aerobic and anaerobic exercises, making it suitable for team sports.
 - ii. Allows for a greater volume of work in a shorter time.
 - iii. Enables measurable athlete progress and allows for planned recovery periods.
 - iv. Recovery phases provide opportunities for trainers to offer guidance and feedback.
 - v. Coaches can easily assess an athlete's effort levels.
2. Disadvantages:
 - vi. Maintaining performance becomes challenging as fatigue sets in.
 - vii. Cardiac output must be carefully monitored.
 - viii. The routine may become monotonous over time.

Dynamic Strength : Dynamic strength refers to the ability of a muscle to exert force while moving an object over a specified distance. During this process, the muscle contracts and shortens as it moves the load. Various sports require different types of muscle strength, including:

1. **Maximum Strength :** Maximum strength is the highest level of force that a muscle or group of muscles can generate. It involves recruiting all motor units to produce maximum tension against an external resistance. This type of strength depends on neuromuscular efficiency, which enhances both intra and intermuscular coordination. It is essential in sports that require handling significant resistance, such as weightlifting, hammer throw, shot put, discus throw, and javelin throw. Additionally, maximum strength plays a crucial role in short bursts of exertion in events like the high jump, long jump, and pole vault.
2. **Explosive Strength :** Explosive strength enables an athlete to generate maximum force in the shortest possible time. It involves rapid muscle lengthening, followed by a quick acceleration during the contraction phase. This strength is crucial for overcoming resistance at high speed. It is based on the contractile ability of muscles to generate tension quickly, while power is enhanced by

minimizing transition time between muscle lengthening and shortening during the stretch-shortening cycle. Explosive strength is essential in sprint starts, rapid bursts of movement in various sports, and activities such as weightlifting, shot put, and hammer throw.

3. **Strength Endurance :** Strength endurance refers to the ability of muscles to sustain contraction or maintain a consistent level of force over extended periods. It is crucial for athletes who require prolonged exertion without significant loss of strength.

- 154.** What is Endurance? Explain any two types of Endurance on the basis of duration of the activity with suitable examples from sports.

Ans :

2024

Endurance refers to an individual's ability to sustain a certain level of energy production over an extended period. It is the capability to maintain physical activity without excessive fatigue. Like strength, endurance is also considered a conditional ability. Due to its significance in health, athletic training, and competitive sports, endurance has been extensively studied.

Classification Based on Activity Duration : This classification focuses on cyclic sports activities and is based on physiological factors. According to Harre (1986), endurance can be divided into the following subcategories:

1. **Speed Endurance :** Speed endurance is the ability to resist fatigue in cyclic activities lasting up to 45 seconds. A classic example is the 400 m sprint in track and field. This type of endurance depends largely on an athlete's power and energy production capacity.
2. **Short-Term Endurance :** Short-term endurance is required for activities lasting 45 seconds to approximately 2 minutes. The 800 m run is a prime example of this endurance type. It primarily relies on both speed endurance and strength endurance to sustain performance.
3. **Medium-Time Endurance :** Medium-time endurance is necessary for activities that last between 2 minutes and 11 minutes. Events such as the 1500 m and 3000 m runs and 100 m rowing fall into this category. While this endurance type still depends on speed and strength endurance, its reliance on these factors is comparatively less than in short-term endurance.

4. Long-Time Endurance : Long-time endurance is essential for activities that last beyond 11 minutes. It is required in events like marathons and cross-country races, where sustaining performance over a prolonged period is crucial. Athletes in these sports rely primarily on aerobic capacity and efficient energy utilization to maintain endurance.

155. What are the types of 'strength'? Explain isotonic method to improve strength.

Ans :

Delhi 2019

Strength is a fundamental component of fitness and plays a crucial role in athletic performance. In certain sports like weightlifting, wrestling, and shot put, strength is the primary physical attribute required for success. In other sports, including team-based activities, strength is an essential aspect of overall fitness and contributes to enhanced performance.

Types of Strength:

1. Dynamic Strength : Dynamic strength refers to the force a contracting muscle can exert while moving an object over a specified distance. During this process, the muscle shortens as it moves the load, making dynamic strength synonymous with isotonic strength since it involves movement.
Example: Performing push-ups requires dynamic strength. However, during continuous movement, muscles may experience fatigue, leading to a diminishing effect where they stop functioning effectively after a certain time.
2. Static Strength : Static strength refers to the force a muscle can apply against an immovable object without significantly shortening its length. It is also known as isometric strength, as it involves holding a position under tension rather than performing visible movements. Though not commonly used in most sports, weightlifters rely on static strength during certain phases of their lifts, such as maintaining a hold before lifting a heavy weight.
3. Isotonic Exercises : Isotonic exercises involve muscle contraction with movement against a constant load, such as lifting weights. This differs from isometric exercises, where muscle contractions occur without movement of the body's involved parts.

Common examples of isotonic exercises:

- i. Calisthenics (e.g., push-ups, sit-ups, squats)
- ii. Running and jumping on the spot
- iii. Weight training

Benefits of Isotonic Exercises

- i. Enhances daily life activities by improving muscle strength and range of motion.
- ii. Requires little or no special equipment, making it accessible.
- iii. Develops muscle strength effectively.
- iv. Improves bone density, reducing the risk of osteoporosis.
- v. Boosts cardiovascular health, supporting overall fitness.

156. Write in detail about strength improving methods Isometric, Isotonic and Isokinetic.

Ans :

AI 2019

Types of Strength-Improving Exercises : Exercises aimed at enhancing strength can be categorized into three main groups: isometric, isotonic, and isokinetic exercises. Each type of exercise has distinct characteristics and benefits.

1. Isometric Exercises Isometric exercises involve static muscle contractions where the joint angle and muscle length remain unchanged during exertion. Unlike dynamic movements, isometric exercises do not involve a range of motion but instead require the muscle to hold tension without movement.

Key Features:

- i. No change in muscle length during contraction.
- ii. In terms of physics (work done = force $\times$ distance moved), the work done is zero since there is no movement.
- iii. Requires little to no equipment and takes less time to perform.
- iv. Beneficial for injury rehabilitation since there is minimal stress on joints.
- v. Found in sports such as archery and gymnastics, where holding static positions is crucial.

2. Isotonic Exercises : Isotonic exercises involve muscle contractions with movement, where the muscle shortens against a constant load. These exercises are widely used in sports and are excellent for developing strength and endurance.

Key Features:

- i. Involve both muscle lengthening and shortening, known as eccentric contraction and concentric contraction, respectively.

- 150.** (a) What is the Ballistic method for improving flexibility?
- (b) Why has this method come under scrutiny, and what is the Proprioceptive Neuro-Muscular Facilitation (PNF) technique?

Ans :

COMP 2005

- (a) The Ballistic method for improving flexibility involves performing a movement with a swing and rhythm, using the body's momentum to force a joint beyond its normal range of motion. This method involves bouncing or jerky movements to increase the stretch.
- (b) The Ballistic method has come under scrutiny because many physical therapists and experts believe that the uncontrolled, jerky movements can lead to overstretching of the muscles and increase the risk of injury. In contrast, the Proprioceptive Neuro-Muscular Facilitation (PNF) technique is considered a more advanced and effective method. It is based on the principle that if a muscle is contracted maximally for a few seconds, it will achieve maximum relaxation immediately afterward, allowing it to be stretched further. The technique involves contracting the muscle, relaxing it, and then gradually stretching it to its limit.

NODIA

- ii. Structural items, such as pushing against a wall or fence.
- iii. Free weights, weight machines, or elastic bands, where the muscle holds a weight in a fixed position.
- iv. Pressure-plate equipment, which measures maximal force exerted.

Key Features of Isometric Exercises:

- The term isometric comes from “iso” (same) and “metric” (length).
 - There is no change in muscle length during contraction.
 - In physics terms, since work = force × distance, no work is done as the distance moved is zero.
 - These exercises require minimal or no equipment and take less time.
 - Due to the absence of movement, they are useful for injury rehabilitation.
 - Sports like archery and gymnastics involve isometric movements.
2. Isotonic Exercises : In isotonic exercises, the contracting muscle shortens while working against a constant load, such as lifting a weight. Unlike isometric exercises, where the muscle remains static, isotonic exercises involve visible movement. The term “isotonic” originates from Greek, where “iso-” means equal, and “tonos” means tone, referring to the maintenance of consistent muscle tone during movement. These exercises are highly beneficial for sports and effective in strength development. Examples include calisthenics, running, jumping, and weight training.

Key Features of Isotonic Exercises:

- Muscle movements involve both lengthening (eccentric contraction) and shortening (concentric contraction).
- Exercises can be performed with or without equipment, making them versatile.
- They increase muscle flexibility and length, making them ideal for conditioning and strength training.

FIVE MARKS QUESTIONS

- 151.** Differentiate between Isometric and Isotonic exercise with suitable example.

Ans :

Term-II, 2021-22

1. Isometric Exercises : Isometric exercises, or isometrics, are a type of strength training where the joint angle and muscle length remain unchanged during contraction. These exercises are performed in static positions, rather than involving dynamic movements through a range of motion. Isometric exercises involve muscle contraction without any visible movement of the joint angle, distinguishing them from isotonic contractions, where muscle length changes while the contraction strength remains constant. Resistance in isometric exercises is typically applied using:
- The body's own structure and ground resistance.

- 152.** What is Endurance? Explain its types.

Ans :

Delhi 2017

Endurance can be categorized based on physical parameters into muscular endurance, cardiovascular endurance, and aerobic or anaerobic endurance. It is also classified according to the nature of activity and the duration of activity.

Aerobic and Anaerobic Endurance

performed on hilly terrain, allowing for natural variations in pace.

Fartlek training is one of the most effective conditioning methods for sports where endurance is a fundamental requirement. The training can take place on hilly paths, riverbeds, forest trails, muddy roads, or sandy tracks. Self-discipline plays a crucial role in this type of training, as the pace and intensity are not predetermined. Additionally, various bodyweight exercises such as hopping, jumping, squat jumps, and double-hop jumps can be incorporated at different intervals, adding variety and enhancing strength along with endurance.

Advantages of Fartlek Training

1. Although primarily an off-season training method, it significantly helps in building endurance among athletes.
2. Offers a psychological advantage over other training methods, as changing surroundings and varied pace help delay fatigue.
3. Particularly beneficial for endurance-based sports, such as cross-country running.
4. Helps improve balance and coordination of the ankles, knees, and thighs due to the uneven terrain, making it a highly functional form of training.

159. What do you understand by coordinative ability? Discuss about 6 different types of coordinative abilities.

Ans :

AI 2019

Coordinative Ability : Coordinative ability refers to an individual's capacity to seamlessly transition between a series of smaller movements within a larger task. It is the ability to repeatedly execute a sequence of movements smoothly and accurately, involving sensory perception, muscular contractions, and joint movements.

Types of Coordinative Abilities : Different types of coordinative abilities play a crucial role in various sports, enhancing an athlete's efficiency and precision.

1. **Orientation Ability :** Orientation ability refers to an individual's capability to determine their body position and movement in relation to a moving object or opponent. This skill relies on sensory organs, such as the eyes and kinesthetic senses. It is particularly important in sports like basketball, football, volleyball, and table tennis, where players must react to fast-moving objects and opponents.

2. **Coupling Ability :** Coupling ability is the capacity to coordinate multiple body parts effectively to perform a complex movement. This skill is essential in sports requiring a combination of movements, such as boxing and wrestling, where athletes must synchronize punches, footwork, and defensive actions.
3. **Reaction Ability :** Reaction ability is the speed and efficiency with which an individual responds to an external stimulus, such as a light or sound signal. It is further divided into:
 - i. **Simple Reaction Ability,** where the response is to a single, predictable stimulus.
 - ii. **Complex Reaction Ability,** where the response involves multiple stimuli or unpredictable situations.
4. **Balance Ability :** Balance ability enables an individual to maintain or quickly regain stability during or after movement. It plays a crucial role in sports requiring precise control over body positioning, such as regaining balance after performing a handstand on parallel bars.
5. **Rhythm Ability :** Rhythm ability is the skill of perceiving and synchronizing movements with an external rhythm. This is particularly important in sports like rhythmic gymnastics and figure skating, where athletes perform movements in harmony with music. It is also essential in synchronized swimming, where maintaining rhythm is a fundamental requirement.
6. **Adaptation Ability :** Adaptation ability refers to an individual's capacity to adjust movements effectively based on anticipated or unexpected changes in the environment. This skill is essential for solving motor tasks efficiently, even when conditions suddenly shift. It is particularly useful in fast-paced sports where unpredictable game dynamics require quick adjustments.
7. **Differentiation Ability :** Differentiation ability is the capacity to perform movements with high precision, efficiency, and coordination. It allows an athlete to finely control movement intensity, direction, and timing. This ability improves with experience and repeated practice, leading to mastery of motor actions and seamless execution of complex movements.

- ii. Can be performed with or without equipment (e.g., bodyweight exercises like push-ups, squats).
 - iii. Help increase muscle flexibility and length, making them effective for overall conditioning.
 - iv. Common examples include calisthenics, running, jumping, and weight training.
3. Isokinetic Exercises : Isokinetic exercises involve controlled movements at a constant speed, typically using specialized machines (dynamometers). These exercises combine the benefits of isometric and isotonic exercises, providing maximum resistance through a full range of motion.

Key Features:

- i. Blend of isotonic and isometric exercises, offering a balanced strength workout.
- ii. Machines control resistance across the entire range of motion, ensuring consistent muscle engagement.
- iii. Used mainly in rehabilitation and high-performance training, as machines are expensive and complex.
- iv. Commonly applied in water sports, climbing, and skating, where controlled motion is essential.

- 157.** Define flexibility and explain methods to develop flexibility.

Ans :

Term-II, 2021-22

Flexibility refers to the maximum range of motion possible at a joint, allowing movement without causing strain or discomfort. It is a joint-specific attribute, meaning that an individual may have greater flexibility in certain joints, such as the shoulders, while being less flexible in others, like the knees.

Types of Stretching Techniques

1. Ballistic Stretching : Ballistic stretching involves dynamic movements where the individual stretches while in motion. This technique relies on momentum generated from repeated bouncing or swinging movements to stretch muscles. Common ballistic stretching exercises include trunk swings, forward and backward leg swings, and sideward bending movements. Although ballistic stretching can be effective in improving flexibility, most experts caution against its use as it may overstretch muscles, leading to soreness or injury.

2. Static Stretching : Static stretching is one of the most widely used and effective stretching techniques. It involves slowly and gently moving into a stretched position and holding it for a certain duration. The movement should go through the full range of motion until a slight tension or tightness is felt in the muscles. As the muscles relax, the stretch can be extended further. To avoid injury, static stretching should not be painful or forcefully extended beyond the natural range of motion. The recommended duration for holding a stretch is 10 to 30 seconds, with a maximum of five repetitions for each exercise.
3. Passive Stretching : Passive stretching involves an external force, usually applied by a partner, to stretch a relaxed joint. This technique requires close communication between the partners to ensure that the stretch is applied slowly and safely. Sudden or forceful movements should be avoided, as they may lead to injuries.
4. Proprioceptive Neuromuscular Facilitation (PNF) Stretching : PNF stretching is regarded as one of the most effective methods for improving flexibility in the shortest possible time. It is commonly used by athletes and involves muscle contraction before stretching to achieve maximum muscle relaxation.

Procedure for PNF Stretching:

- i. Move into a stretch position until a mild stretching sensation is felt.
- ii. A partner holds the limb in this stretched position.
- iii. Contract the opposing (antagonistic) muscles for 6 to 10 seconds by pushing against the partner's resistance, then relax.
- iv. The partner then moves the limb further into the stretch until a new stretching sensation is felt.
- v. Repeat this process four to five times for optimal flexibility gains.

NODIA

- 158.** List down any four advantages of fartlek training method.

Ans :

2022-23

Fartlek Training Method : The Fartlek training method originated in Sweden and was introduced by Gosta Holmer. The term "Fartlek" translates to "speed play", as this training technique involves varying speeds and intensities during a run. It is a form of cross-country running, typically

demands, ensuring that the improvements in strength translate into better performance on the field.

2. **Endurance Training :** Endurance refers to the ability to sustain physical activity over an extended period. Aerobic exercises such as running, cycling, swimming, and rowing are fundamental in developing cardiovascular endurance. High-intensity interval training (HIIT) is another effective method, combining short bursts of intense activity with periods of recovery to boost both aerobic and anaerobic capacities. Consistent endurance training leads to improved oxygen utilization, increased mitochondrial density, and enhanced stamina, which are crucial for sports requiring prolonged exertion.
3. **Speed Training :** Speed development is achieved through techniques that enhance acceleration and quickness. Sprint drills, resistance sprints, and agility ladder exercises are common methods used to improve speed. These training modalities focus on enhancing fast-twitch muscle fibers, neuromuscular coordination, and reaction times. Speed training is particularly important in sports that demand rapid changes in direction and explosive movements. By incorporating plyometric exercises and technique refinement, athletes can significantly improve their sprint performance and overall quickness on the field.
4. **Integration of Methods :** Combining these training methods ensures that athletes develop a well-rounded fitness profile, addressing strength, endurance, and speed simultaneously. This integrated approach maximizes performance and reduces the risk of injury by ensuring that all physical capacities are developed harmoniously.

163. Explain the Types & Methods to Develop Flexibility and Coordinative Ability.

Ans :

DELHI 2015

1. **Flexibility Development :** Flexibility is the ability to move joints through their full range of motion and is essential for injury prevention and performance enhancement. Stretching exercises, including static, dynamic, and proprioceptive neuromuscular facilitation (PNF) stretching, are commonly used methods to develop flexibility. Static stretching involves holding a stretch for a

period, which can be useful during cool-down sessions, while dynamic stretching is incorporated into warm-ups to prepare muscles for activity. PNF stretching, which involves both stretching and contracting the muscle, can yield significant improvements in flexibility. Regular flexibility training improves muscle elasticity, joint mobility, and overall coordination, thereby enhancing athletic performance.

2. **Coordinative Ability :** Coordination in sports refers to the efficient interaction of muscles and the nervous system to perform smooth and controlled movements. Developing coordinative ability involves drills and exercises that challenge balance, timing, and spatial awareness. Activities such as balance exercises, agility drills, and sport-specific coordination drills help refine these skills. Techniques like ladder drills, cone drills, and reaction time exercises are particularly effective in enhancing motor skills. Improved coordination leads to better technique, reduced risk of injury, and more effective execution of complex movements during competition.
3. **Methods and Integration :** Integrating flexibility and coordination training into regular practice sessions is essential for overall athletic development. For example, incorporating yoga or Pilates can simultaneously improve flexibility, core strength, and balance, contributing to better coordination. Similarly, combining dynamic warm-ups with balance and agility drills prepares the body for the demands of competition. Coaches often design training sessions that blend these elements, ensuring that athletes develop not only the physical capacity but also the fine motor skills required for peak performance. This integrated approach helps athletes maintain optimal movement efficiency, which is critical for executing rapid, precise movements under pressure.

164. Describe Circuit Training and Explain Its Importance in Sports.

Ans :

SQP 2019

Circuit training is a method of exercise that involves a series of stations or exercises performed consecutively with minimal rest in between. Each station targets different muscle groups or physical

attributes such as strength, endurance, flexibility, or balance. This training approach is versatile and can be adapted to meet the specific demands of various sports. Circuit training is designed to provide a full-body workout that simultaneously improves cardiovascular fitness and muscular endurance.

1. **Benefits and Importance :** The importance of circuit training in sports lies in its efficiency and comprehensiveness. By combining aerobic and anaerobic exercises within a single session, circuit training maximizes the benefits of both training modalities. This approach is particularly valuable for athletes who need to improve overall fitness while maintaining sport-specific skills. The continuous nature of circuit training helps in boosting metabolism, enhancing stamina, and building functional strength, which are crucial for high-intensity sports. Additionally, the varied nature of the exercises keeps training sessions engaging and prevents monotony, which can be beneficial for long-term adherence to fitness programs.
2. **Application in Sports Training :** For athletes, circuit training offers a practical solution to develop multiple physical qualities concurrently. It is often integrated into pre-season and in-season training programs to ensure that athletes remain in top physical condition without overloading any single muscle group. The structure of circuit training also allows for easy modifications, enabling coaches to adjust the intensity, duration, and complexity of the exercises according to the athlete's needs and the specific demands of their sport. This adaptability makes circuit training an indispensable component of modern sports training regimes, promoting balanced fitness and contributing to improved performance and injury prevention.

- 165.** Define 'Talent Identification' and 'Talent Development' in the context of sports. Explain in detail the five-stage process that transitions an individual from initial discovery to a potential elite performer.

Ans :

COMP 2014

Talent Identification is defined as "the process by which children are encouraged to participate in the sport they are most likely to succeed, based on selected parameters". It is the initial step of recognizing participants at an early age who possess the potential to become elite performers in

the future. Talent Development is the subsequent and critical phase that provides these identified athletes with a suitable learning environment designed to accelerate their progress and help them realize their full potential. The progression from a beginner to a successful international athlete is often structured through a five-stage process:

1. **Talent Detection:** This is the first stage and involves the discovery of potential performers who are not currently involved in the sport in question. It is about finding individuals with raw, untapped potential.
2. **Talent Identification:** This second stage focuses on recognizing participants who are already involved in a sport and show signs of having the potential to become elite performers in the future. This stage uses specific parameters and tests to predict future performance capacity.
3. **Talent Development:** Once identified, athletes enter this crucial phase. It involves providing them with a suitable learning environment, including expert coaching, proper facilities, and structured training programs, to accelerate their growth and help them realize their potential.
4. **Talent Selection:** This is an ongoing process of identifying individuals at various stages of their development who consistently demonstrate the pre-requisite levels of performance needed to advance. This may involve selection for regional, national, or elite junior programs.
5. **Talent Transfer:** This final stage focuses on situations where an athlete might be better suited for a different sport. It involves transferring an athlete from one sport to another where there are more significant opportunities for them to succeed based on their specific attributes.

- 166.** Explain the concept of periodization in sports training by describing the purpose and characteristics of the Microcycle, Mesocycle and Macrocycle. How do these three cycles work together in an annual training plan?

Ans :

DELHI 2016

Periodization is a systematic approach to sports training that involves dividing the overall training plan into smaller, more manageable phases or cycles. The three primary cycles used in this process are the Microcycle, Mesocycle, and

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Macrocycle.

1. Microcycle: This is the shortest training cycle, typically lasting from 3 to 10 days. It forms the building block of the entire training process and focuses on immediate training objectives. A microcycle is usually structured to balance the training load, for example, by alternating days of high load with days of medium or low load to allow for active recovery and prepare the athlete for the next cycle.
2. Mesocycle: This is a cycle of medium duration, generally lasting from 3 to 6 weeks. It consists of several microcycles and is designed to tackle specific training tasks. The purpose of a mesocycle could be to acquire and master new skills, develop specific physical fitness components, or prepare for a particular competition. A 4-week mesocycle is often considered ideal as it is a sufficient period to see significant physiological and psychological changes. The final week often serves as a transitional phase for recovery.
3. Macrocycle: This is the longest training cycle, with a duration of 3 to 12 months, and often corresponds to an entire training year or season. It is comprised of several mesocycles. The main purpose of the macrocycle is to enable the sportsperson to improve their overall performance capacity and achieve an optimal, peak performance at a specific time during a major competition.

These three cycles work together in a hierarchical structure within an annual plan. The long-term goals of the Macrocycle (e.g., peaking for a national championship) determine the specific objectives of each Mesocycle (e.g., a block focused on building strength, another on speed). Each mesocycle is then broken down into a series of Microcycles, which dictate the daily and weekly training schedules, load, and recovery protocols needed to achieve the mesocycle's goals.

- 167.** Elaborate on the different methods used to develop endurance. Your answer should detail the Continuous Method (including its variations like Fartlek) and the Interval Method, explaining the principles behind each.

Ans :

OD 2018

Endurance, or the ability to resist fatigue, is a crucial component of fitness that can be developed through several specific training methods. Two of the most important methods are the Continuous

Method and the Interval Method.

1. The Continuous Method : As its name suggests, this method involves performing an exercise continuously for a long duration without any break or rest period. Because the duration is long, the intensity is typically low to medium. Its variations include:
 - i. Slow Continuous Method: The activity is performed at a slow, uniform speed for over 30 minutes, keeping the heart rate between 140-160 beats per minute. It is effective for increasing muscle glycogen and the number of mitochondria.
 - ii. Fast Continuous Method: The intensity is higher, with a heart rate between 160-180 bpm, for a duration of at least 20 minutes. This is effective for improving VO2 max and anaerobic capacity.
 - iii. Variable Pace Method: The pace of the activity is changed at pre-planned intervals, with the heart rate fluctuating between 140-180 bpm.
 - iv. Fartlek Method: This is a Swedish term for 'speed play'. It is a variation of the variable pace method, but the changes in speed are not pre-planned; instead, the athlete changes pace according to the terrain, their surroundings, or how they feel.
2. The Interval Method : This is a versatile method that involves performing an activity at a comparatively high intensity, interspersed with intervals or breaks of incomplete recovery. The principle behind this method is to stress the body with high-speed work to elevate the heart rate significantly (e.g., up to 180 bpm), followed by a short rest interval where the heart rate drops only partially (e.g., to 120-130 bpm) before the next work period begins. This repeated stress and partial recovery cycle is highly effective at improving the circulatory system, anaerobic capacity, lactic acid tolerance, and VO2 max.

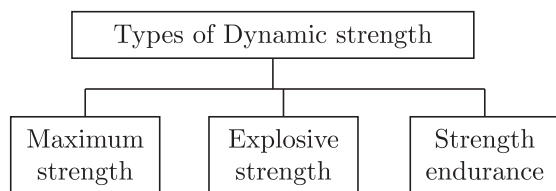
- 168.** What are coordinative abilities and why are they important in sports? Describe in detail any four types of coordinative abilities, providing sporting examples for each.

Ans :

SQP 2020

Coordinative abilities are those abilities of an individual that enable them to perform various motor activities correctly, efficiently, and with a high degree of quality. They are primarily

176. In reference to the picture answer the following questions :



- (i) Which type of dynamic strength refers to the greatest force a muscle can produce in a single maximal effort?
- Strength Endurance
 - Maximum Strength
 - Explosive Strength
 - Static Strength

Ans :

- (b) Maximum Strength
- (ii) Explosive Strength is best described as:
- The ability to maintain force output for extended periods
 - The ability to generate maximum force in the shortest time
 - Sustaining force with no visible movement
 - Slowly increasing muscle tension over a long duration

Ans :

- (b) The ability to generate maximum force in the shortest time
- (iii) Which of the following best defines Strength Endurance?
- Producing force through a single powerful contraction
 - Maintaining or repeating force production over a period of time
 - Generating maximum force in minimal time
 - Holding a static position for an extended duration

Ans :

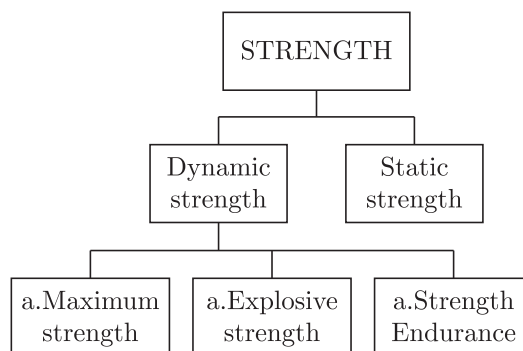
- (b) Maintaining or repeating force production over a period of time
- (iv) Which statement best describes Dynamic Strength overall?
- It involves producing force without any joint movement
 - It is the ability to generate force while the muscle length changes
 - It is unrelated to movement or speed

- (d) It is only used in short-duration, high-intensity sports

Ans :

- (b) It is the ability to generate force while the muscle length changes

177. In reference to the picture answer the following questions :



- (i) Which statement best differentiates Dynamic Strength from Static Strength?
- Dynamic strength involves force production with movement, while static strength involves force production with no visible movement
 - Dynamic strength is always lower in intensity than static strength
 - Static strength is used only in endurance sports
 - Both dynamic and static strength require continuous muscle length changes

Ans :

- (a) Dynamic strength involves force production with movement, while static strength involves force production with no visible movement
- (ii) Maximum Strength is defined as the:
- Ability to sustain force production over long periods
 - Greatest force a muscle or group of muscles can produce in a single effort
 - Ability to generate force quickly
 - Force produced without conscious control

Ans :

- (b) Greatest force a muscle or group of muscles can produce in a single effort

170. (a) Define flexibility and speed as components of fitness. Explain the different types of each.
- (b) Describe one method for developing speed (e.g., Pace Runs) and one method for developing flexibility (e.g., PNF Technique) in detail.

Ans :

OD 2014

- (a) (i) Flexibility is the ability to execute a movement with a greater amplitude or range of motion around a joint. It is often described as mobility or stretchability. The types of flexibility are:

Passive Flexibility: The ability to perform movements with a greater range with external help (e.g., a partner).

Active Flexibility: The ability to perform movements with a greater range without external help. This is further divided into Static Flexibility (required for stationary positions) and Dynamic Flexibility (required while moving).

- (ii) Speed is the ability to execute motor movements as quickly as possible. The types of speed are:

Reaction Ability: Reacting quickly to a stimulus.

Acceleration Ability: Reaching high speed from a static position.

Movement Speed: Performing a single movement in minimum time.

Locomotor Ability: Maintaining maximum speed for maximum duration.

Speed Endurance: Performing movements with high speed under fatigue.

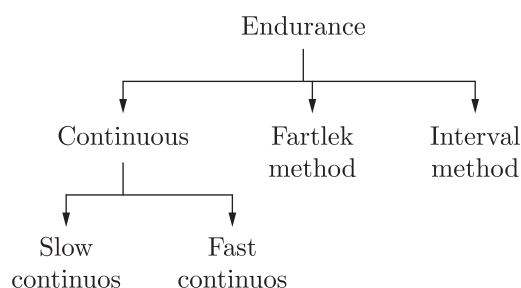
- (b) A specific method for developing each component is:

- i. Method for Speed (Pace Runs): Pace runs involve running a set distance at a uniform, pre-determined speed. This method is crucial for middle and long-distance races (800 m and above) where an athlete must conserve energy by maintaining an optimal pace rather than sprinting at full speed. For training, an athlete might run at a maximum steady speed for a distance that is 10-20% longer than their actual racing distance, with complete recovery between repetitions.
- ii. Method for Flexibility (PNF Technique): The Proprioceptive Neuro-Muscular Facilitation (PNF) technique, also known

as post-isometric stretch, is an advanced method for improving flexibility. It is based on the principle that if a muscle is contracted maximally for a few seconds, it achieves maximum relaxation immediately after, allowing for a deeper stretch. The process involves having the athlete contract the target muscle against resistance for 5-7 seconds, then relaxing and immediately stretching that muscle to its limit, holding the stretch for 8-10 seconds.

CASE BASED QUESTION

1. In reference to the picture answer the following questions :

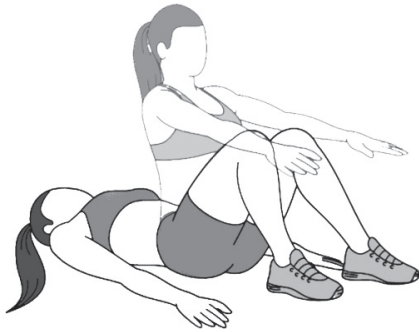


- (a) The heart rate in continuous method of training should be about _____ beats per minute and duration for the activity should be _____.
- (b) Interval Training Method is based on the principle of _____.
- (c) Fartlek is a _____ term meaning speed play.
- (d) Fartlek was developed by _____ in 1930.

Ans :

- (a) The heart rate in the continuous method of training should be about 130-160 beats per minute, and the duration for the activity should be 20-60 minutes.
- (b) Interval Training Method is based on the principle of work and recovery.
- (c) Fartlek is a Swedish term meaning speed play.
- (d) Fartlek was developed by Gösta Holmér in 1930.

- 172.** In reference to the picture answer the following questions :

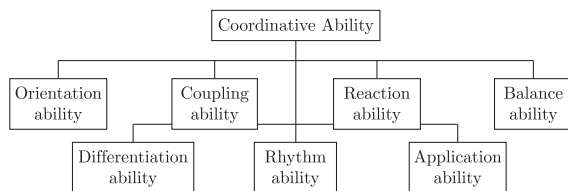


- (a) Sit-ups are examples of which kind of strength?
- (b) _____ Method was developed by J J Perrine in 1960.
- (c) _____ has no movement or change in size of muscles.

Ans :

- (a) Sit-ups are examples of dynamic strength (also known as muscular endurance).
- (b) Isokinetic method was developed by J. J. Perrine in 1960.
- (c) Isometric contraction has no movement or change in the size of muscles.

- 173.** In reference to the picture answer the following questions :



- (i) Which coordinative ability refers to the accurate adjustment of body position in space relative to a moving object or changing environment?
- (a) Differentiation Ability
- (b) Orientation Ability
- (c) Coupling Ability
- (d) Balance Ability

Ans :

- (b) Orientation Ability
- (ii) The ability to precisely gauge and adjust the intensity, force, or timing of a movement is called:

- (a) Reaction Ability
- (b) Rhythm Ability
- (c) Differentiation Ability
- (d) Application Ability

Ans :

- (c) Differentiation Ability
- (iii) Which coordinative ability involves combining several partial movements into one fluid motion, such as smoothly linking an approach run to a jump?
- (a) Coupling Ability
- (b) Balance Ability
- (c) Orientation Ability
- (d) Rhythm Ability

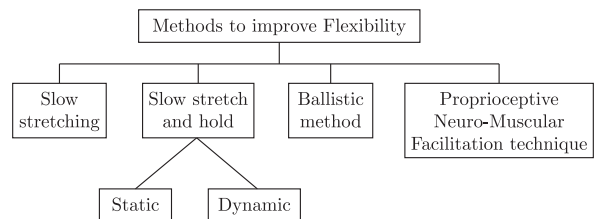
Ans :

- (a) Coupling Ability
- (iv) The ability to maintain equilibrium and body posture, whether static or dynamic, is known as:
- (a) Reaction Ability
- (b) Balance Ability
- (c) Differentiation Ability
- (d) Rhythm Ability

Ans :

- (b) Balance Ability

- 174.** In reference to the picture answer the following questions :



- (i) Which of the following best describes the Static Stretching method?
- (a) Short, bouncing movements at the end of the range of motion
- (b) Holding a stretched position for a prolonged period without movement
- (c) Rapid contraction and relaxation of the muscle
- (d) Using external resistance throughout the entire movement

Ans :

- (b) Holding a stretched position for a prolonged period without movement

- (ii) The Ballistic Method of stretching typically involves:
- Gentle, continuous pulling on a muscle
 - Alternating muscle contraction and relaxation
 - Slow movement to the end of the range of motion, then holding
 - Quick, bouncing movements beyond the normal range of motion

Ans :

(d) Quick, bouncing movements beyond the normal range of motion

- (iii) PNF (Proprioceptive Neuromuscular Facilitation) stretching commonly includes:
- No muscle contractions, just passive stretching
 - Rapid jerking actions at the end of the range of motion
 - An isometric contraction of the muscle, followed by a deeper stretch
 - Minimal partner involvement or resistance

Ans :

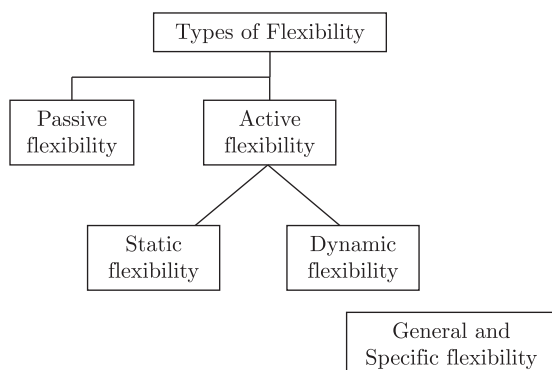
(c) An isometric contraction of the muscle, followed by a deeper stretch

- (iv) Dynamic Stretching is characterized by:
- Holding a stretch in a single position for 30+ seconds
 - Controlled, sport-specific movements through a full range of motion
 - Using a partner to provide external force throughout the stretch
 - Rapid bouncing and forceful extension of the joint

Ans :

(b) Controlled, sport-specific movements through a full range of motion

175. In reference to the picture answer the following questions :



- (i) Passive Flexibility is best described as:
- The ability to move a joint without any external help
 - The ability to hold a stretch using an external force (e.g., partner, apparatus)
 - Rapid, forceful movements through a joint's range of motion
 - Using a gentle bounce at the end of a stretch

Ans :

(b) The ability to hold a stretch using an external force (e.g., partner, apparatus)

- (ii) Active Flexibility generally refers to:
- Holding a stretch for 10 seconds or more without muscle engagement
 - Relying on a partner to apply additional force
 - The range of motion a person can achieve using their own muscular effort
 - Movements performed exclusively with ballistic bouncing

Ans :

(c) The range of motion a person can achieve using their own muscular effort

- (iii) Static Flexibility is the ability to:
- Move a joint quickly through its entire range of motion
 - Sustain an extended position without movement for a period of time
 - Maintain equilibrium while balancing on one foot
 - Generate maximum force in a short time

Ans :

(b) Sustain an extended position without movement for a period of time

- (iv) Dynamic Flexibility involves:
- Slowly applying force until the muscle fatigues
 - Short, jerky movements at the end of a range of motion
 - Controlled, continuous movement through a joint's full range of motion
 - Partner-assisted stretching with no muscular effort

Ans :

(c) Controlled, continuous movement through a joint's full range of motion

- (ii) Which of the following best describes the movements shown in the image?
- Static stretching with no change in body position
 - Ballistic stretching involving rapid, forceful bouncing
 - Passive stretching using an external aid
 - A controlled flow of active movements that engage the muscles

Ans :

- (d) A controlled flow of active movements that engage the muscles
- (iii) A key benefit of active flexibility exercises is:
- They rely entirely on a partner to assist the stretch
 - They help improve muscular control and coordination
 - They do not increase heart rate at all
 - They only target the lower body

Ans :

- (b) They help improve muscular control and coordination
- (iv) Which muscles are primarily engaged to achieve and maintain the positions in the image (from forward bend to plank)?
- Abdominals, shoulders, and hip flexors
 - Forearm extensors only
 - Neck and wrist flexors only
 - None of the body's core muscles

Ans :

- (a) Abdominals, shoulders, and hip flexors

180. In reference to the picture answer the following questions :



- (i) PNF stretching generally involves:

- Only passive stretching without muscle activation
- Rapid, bouncing movements at the end of the range of motion
- An isometric contraction of the target muscle, followed by a deeper stretch
- Holding a static position for 30 seconds without any muscle engagement

Ans :

- (c) An isometric contraction of the target muscle, followed by a deeper stretch
- (ii) One benefit of PNF stretching is:
- Decreased range of motion
 - Increased muscular tension throughout the day
 - Enhanced flexibility and range of motion
 - Less involvement of neuromuscular coordination

Ans :

- (c) Enhanced flexibility and range of motion
- (iii) During a typical PNF routine, the partner often:
- Applies no force at any time
 - Quickly jerks the limb to extend the range of motion
 - Assists in both the isometric contraction and the subsequent stretch
 - Maintains the same limb position without movement

Ans :

- (c) Assists in both the isometric contraction and the subsequent stretch
- (iv) In the hold-relax PNF method, the muscle is:
- Repeatedly bounced to reach a deeper stretch
 - Contracted isometrically, then relaxed before being passively stretched
 - Contracted concentrically with a fast speed
 - Never stretched beyond its resting length

Ans :

- (b) Contracted isometrically, then relaxed before being passively stretched

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(iii) Explosive Strength refers to the:

- (a) Ability to maintain force for extended durations
- (b) Ability to generate maximum force in the shortest time
- (c) Total force used to lift an object slowly
- (d) Force produced without any movement

Ans :

(b) Ability to generate maximum force in the shortest time

(iv) Strength Endurance is the ability to:

- (a) Perform one maximal contraction with maximum force
- (b) Generate force rapidly for a single explosive movement
- (c) Sustain or repeat force production over a period of time
- (d) Maintain a position without any joint movement

Ans :

(c) Sustain or repeat force production over a period of time

178. In reference to the picture answer the following questions :



(i) The type of stretching demonstrated in the image is:

- (a) Ballistic stretching
- (b) Dynamic stretching
- (c) Partner-assisted (passive) stretching
- (d) Active stretching

Ans :

(c) Partner-assisted (passive) stretching

(ii) Which muscle group is primarily targeted by this stretch?

- (a) Quadriceps
- (b) Hamstrings
- (c) Calf muscles
- (d) Abdominal muscles

Ans :

(b) Hamstrings

(iii) A key benefit of partner-assisted stretching is:

- (a) It eliminates the need for communication
- (b) It allows a deeper stretch with external assistance
- (c) It requires no warm-up
- (d) It involves bouncing motions at the end of the range of motion

Ans :

(b) It allows a deeper stretch with external assistance

(iv) For safe partner-assisted stretching, it is recommended to:

- (a) Apply sudden, forceful pressure to exceed the normal range of motion
- (b) Avoid communicating about pain or discomfort
- (c) Use controlled pressure and maintain clear communication about comfort levels
- (d) Skip the warm-up and stretch immediately

Ans :

(c) Use controlled pressure and maintain clear communication about comfort levels

179. In reference to the picture answer the following questions :



(i) Active Flexibility generally refers to:

- (a) Using a partner or external force to achieve a stretch
- (b) Holding a static position for 30+ seconds without any movement
- (c) The range of motion achieved through one's own muscular effort
- (d) Quickly bouncing at the end of the range of motion

Ans :

(c) The range of motion achieved through one's own muscular effort

dependent on the central nervous system's capacity to control and regulate movement. These abilities are crucial in almost all sports because they allow an athlete to master technical skills, adapt to changing situations, and execute complex movements smoothly and economically.

Four essential types of coordinative abilities are:

1. **Orientation Ability:** This is the ability to determine and continuously adjust the position and movements of the body in time and space relative to a defined field of action (like a court) and moving objects (like a ball or opponents). In team games like basketball, a player needs good orientation ability to be aware of their position, their teammates, their opponents, and the basket all at once.
2. **Coupling Ability:** This is the ability to coordinate the movements of different body parts (e.g., arms, legs, trunk) with one another to produce a definite, goal-oriented whole-body movement. This is vital in sports with complex movements. For example, in gymnastics, a vaulter must perfectly couple the movements of their run-up, jump, and body rotation to execute the skill successfully.
3. **Rhythm Ability:** This is the ability to perceive the rhythm of a movement and to perform the action with the required rhythm. This can involve reproducing a rhythm stored in motor memory or reacting to an external rhythm like music. In figure skating or rhythmic gymnastics, the athlete must express the rhythm of the music through their movements.
4. **Adaptation Ability:** This is the ability to adjust or completely change a movement program based on actual or anticipated changes in a situation. For example, in football, a batsman might prepare to play a certain shot but then has to adapt and change their movement at the last second based on an unexpected bounce of the ball.

- 169.** (a) Differentiate between the three types of dynamic strength: Maximum Strength, Explosive Strength, and Strength Endurance.
- (b) Describe the three main methods used to develop strength: Isometric, Isotonic and Isokinetic exercises, explaining the muscle action involved in each.

Ans :

COMP 2017

- (a) Dynamic strength, which involves visible movement, can be classified into three distinct

types based on its application:

- i. **Maximum Strength** is the ability of a muscle or muscle group to overcome maximum resistance in a single, maximal effort or contraction. It is the absolute peak force one can generate and is crucial in sports like weightlifting and powerlifting.
 - ii. **Explosive Strength** is a combination of strength and speed, defined as the ability to overcome resistance as fast as possible. It is essential for powerful, quick movements like spiking a volleyball or performing a long jump.
 - iii. **Strength Endurance** is a combination of strength and endurance, defined as the ability of a muscle to overcome resistance under conditions of fatigue or for as long as possible. This is required in activities like long-distance rowing or swimming.
- (b) Strength can be developed using three main methods, which are defined by their type of muscle contraction:
- iv. **Isometric Exercises:** In this method, the muscle exerts tension, but there is no visible change in the length of the muscle, and no movement occurs. An example is pushing against an immovable object like a wall. These exercises are useful for maintaining strength, especially during rehabilitation from an injury.
 - v. **Isotonic Exercises:** These are dynamic exercises where movements can be seen directly as the muscle changes length to move a resistance. This includes concentric (muscle shortening) and eccentric (muscle lengthening) contractions. Examples include weight training exercises like bicep curls, running, and jumping. This is considered the best method for developing overall strength.
 - vi. **Isokinetic Exercises:** This method, introduced by J.J. Perrine, involves performing movements on specially designed machines that ensure the muscle applies maximal force throughout the entire range of motion at a constant speed. This type of muscle contraction is common in sports like swimming and rowing.

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CHAPTER 10

PSYCHOLOGY AND SPORTS

SUMMARY

1. PERSONALITY

Personality is the unique blend of characteristics that influences an individual's behavior, emotions, and thought processes. In sports, understanding personality helps coaches and athletes develop strategies for training and performance improvement.

1.1 Definition of Personality

Personality is defined as the enduring set of traits and patterns that guide how an individual perceives, relates to, and interacts with the world. It determines not only one's reactions to different situations but also the way challenges and pressures are managed. In sports, a well-understood personality helps tailor training programs, communication styles, and motivational strategies.

1.2 Types of Personality

Two major approaches help us understand personality in sports:

1. Jung's Classification of Personality : Developed by Carl Jung, this classification distinguishes individuals based on the orientation of their energy:
 - (i) Introverts:
 - (a) Characteristics: Reflective, reserved, and comfortable with solitary pursuits.
 - (b) Sports Examples: Introverts often thrive in sports that require concentration and individual focus, such as archery, swimming, or gymnastics. Their preference for controlled, calm environments can lead to a deep focus on technique and precision.
 - (c) Impact on Training: Coaches working with introverted athletes often focus on creating calm, structured sessions that allow for individual reflection and gradual

progress.

- (ii) Extroverts:
 - (a) Characteristics: Sociable, energetic, and responsive to external stimuli.
 - (b) Sports Examples: Extroverts are naturally drawn to dynamic, team-oriented sports like football, basketball, and cricket, where communication and quick decisions are essential. Their energetic nature can boost team morale and drive group success.
 - (c) Impact on Training: Training for extroverted athletes may involve group activities, interactive drills, and competitive scenarios that stimulate social interaction and energetic performance.
2. The Big Five Theory of Personality : This modern framework breaks personality into five broad dimensions:
 - (i) Openness to Experience:
 - (a) Overview: Reflects creativity, imagination, and curiosity.
 - (b) Relevance: Athletes who are high in openness may be more willing to experiment with new techniques or strategies, making them adaptable in changing game conditions.
 - (ii) Conscientiousness:
 - (a) Overview: Involves self-discipline, organization, and reliability.
 - (b) Relevance: This trait is vital for adhering to training schedules and for athletes who need to plan, practice, and execute techniques with precision.
 - (iii) Extraversion:
 - (a) Overview: Characterized by sociability, assertiveness, and a high level of energy.
 - (b) Relevance: In team sports, extraverted athletes often take on leadership roles, inspiring others with their enthusiasm and direct communication.
 - (iv) Agreeableness:
 - (a) Overview: Denotes warmth, empathy,

- 22.** According to Jung's classification, which type describes individuals who gain energy from social interactions?

(a) Introverts
(b) Extraverts
(c) Ambiverts
(d) Sensation-seekers

Ans :

SQP 2009

(b) Extraverts

Jung's classification identifies extraverts as individuals who gain energy through social interaction and external stimulation. These athletes often thrive in team environments, communicate actively, and display a dynamic approach, positively influencing their performance and interpersonal relationships in sports.

- 23.** Which of the Big Five personality traits reflects openness to experience and creativity?

(a) Conscientiousness
(b) Extraversion
(c) Neuroticism
(d) Openness

Ans :

COMP 2003

(d) Openness

Openness is one of the Big Five traits that reflects an individual's creativity, imagination, and willingness to try new experiences. Athletes with high openness often adapt strategies, innovate techniques, and explore unconventional approaches, thereby enhancing performance and competitive edge.

- 24.** Which Big Five trait is most associated with being organized, disciplined, and reliable in sports?

(a) Agreeableness
(b) Neuroticism
(c) Conscientiousness
(d) Openness

Ans :

DELHI 2001

(c) Conscientiousness

Conscientiousness is characterized by organization, discipline, and reliability. In sports, highly conscientious athletes are methodical in training, adhere to routines, and maintain focus, contributing significantly to consistent performance, effective planning, and long-term success in competitive environments.

- 25.** Which term describes the internal drive to perform and succeed in sports?

(a) Motivation
(b) Anxiety
(c) Fatigue
(d) Cognition

Ans :

OD 2008

(a) Motivation

Motivation is the internal drive that compels individuals to initiate and sustain behaviors toward achieving goals. In sports, it determines an athlete's persistence, effort, and resilience, ultimately influencing training intensity, performance quality, and overall competitive outcomes consistently.

- 26.** What type of motivation originates from internal satisfaction and personal achievement?

(a) Extrinsic motivation
(b) Intrinsic motivation
(c) External reinforcement
(d) Material reward motivation

Ans :

FOREIGN 2006

(b) Intrinsic motivation

Intrinsic motivation originates from internal satisfaction, personal growth, and the inherent pleasure of performing an activity. Athletes driven by intrinsic motivation enjoy challenges for their own sake, leading to sustained engagement, improved performance, and deeper commitment to their sport without relying on external rewards.

- 27.** Which technique is effective for enhancing intrinsic motivation in athletes?

(a) Punitive feedback
(b) Goal setting
(c) Financial incentives
(d) Public criticism

Ans :

SQP 2004

(b) Goal setting

Goal setting is an effective technique that enhances intrinsic motivation by providing clear objectives and milestones. It helps athletes focus on personal progress, maintain commitment, and experience satisfaction when targets are met, thereby reinforcing their internal drive and long-term athletic engagement.

3.1 Reasons Behind Exercise Adherence

Many factors can affect an individual's ability to stick to an exercise routine:

1. **Time Constraints :** Busy schedules, school commitments, and family responsibilities often interfere with regular workouts.
2. **Lack of Motivation :** Without clear goals or inspiration, the drive to exercise regularly may wane.
3. **Low Self-Confidence:** Doubt in one's abilities can lead to avoidance of challenging activities.
4. **Monotony:** Repetitive routines without variation can lead to boredom, making it hard to remain committed.

3.2 Benefits of Regular Exercise

Adhering to an exercise routine offers multifaceted benefits:

1. **Physical Health :** Improved cardiovascular fitness, stronger muscles, and enhanced endurance contribute to overall physical well-being.
2. **Mental Well-being :** Exercise reduces stress, alleviates symptoms of depression and anxiety, and boosts overall mood.
3. **Enhanced Sports Performance :** Consistent practice improves skills such as speed, agility, coordination, and strength, which are critical for competitive sports.
4. **Discipline and Routine :** A structured exercise regimen fosters discipline, time management, and the development of a healthy lifestyle.
5. **Weight Management :** Regular activity helps maintain a balanced body weight and improves metabolic health.

3.3 Strategies to Enhance Exercise Adherence

Several practical strategies can help individuals stick to their exercise routines:

1. **Setting Realistic Goals:** Goals should be specific, achievable, and tailored to the individual's abilities and interests.
2. **Establishing a Consistent Routine:** Creating a fixed schedule for exercise helps build habits.
3. **Incorporating Variety:** Mixing different types of workouts or sports can reduce boredom.
4. **Seeking Social Support:** Exercising with friends, joining clubs, or participating in group fitness sessions can provide encouragement and accountability.
5. **Utilizing Technology :** Fitness trackers, mobile apps, and online communities can help monitor progress and provide regular

reminders.

4. AGGRESSION IN SPORTS

Aggression is a natural emotion in competitive settings. When managed appropriately, it can drive an athlete to perform at their best; however, uncontrolled aggression may result in negative consequences.

4.1 Understanding Aggression

Aggression in sports is defined as a forceful or hostile behavior that can arise from competitive pressure. It encompasses a range of behaviors that may be beneficial when controlled or detrimental when excessive. Understanding the roots of aggression helps athletes channel their energy effectively.

4.2 Types of Aggression in Sports

There are several forms of aggression, each with its own characteristics:

1. **Hostile Aggression:**
 - (i) **Description :** Driven by anger, this form is focused on causing harm or demonstrating superiority.
 - (ii) **Impact :** While it can intimidate opponents, it often leads to penalties or unsportsmanlike conduct if not controlled.
2. **Instrumental Aggression:**
 - (i) **Description:** This is a planned, goal-oriented form of aggression used to gain a competitive advantage.
 - (ii) **Impact:** Seen in sports like football or hockey, where aggressive tactics may be part of a strategic play. It is effective when balanced with skill and precision.
3. **Assertive Behavior:**
 - (i) **Description:** A positive form of aggression that involves displaying confidence, determination, and a proactive attitude without hostility.
 - (ii) **Impact:** Assertiveness can inspire teammates and create a strong competitive edge while maintaining respect for opponents.
4. **Reactive Aggression:**
 - (i) **Description:** This response is triggered by provocation or an unexpected event during a competition.
 - (ii) **Impact:** It may lead to impulsive actions that can harm the athlete's performance if not managed properly.

Ans :

DELHI 2010

(b) One's overall evaluation of self-worth
Self-esteem in sports psychology refers to an athlete's overall evaluation of self-worth and confidence in their abilities. High self-esteem is linked to better performance, resilience, and mental well-being, while low self-esteem can hinder motivation, risk-taking, and competitive success.

35. Which psychological technique involves visualizing successful performance to enhance athletic outcomes?
- (a) Self-talk
 - (b) Mental imagery
 - (c) Goal setting
 - (d) Cognitive restructuring

Ans :

OD 2012

(b) Mental imagery
Mental imagery is a psychological technique that involves vividly visualizing successful performance. This practice enhances motor skills, boosts confidence, and prepares the mind for competition by creating positive mental representations of desired outcomes, ultimately improving focus and execution in sports.

36. What is self-talk in the realm of sports psychology?
- (a) External criticism from coaches
 - (b) Internal dialogue that influences performance
 - (c) A form of physical exercise
 - (d) A type of dietary supplement

Ans :

FOREIGN 2005

(b) Internal dialogue that influences performance
Self-talk is the internal dialogue that athletes use to influence their performance, regulate emotions, and enhance concentration. Positive self-talk helps counteract negative thoughts, builds confidence, and fosters a mental environment conducive to peak performance during training and competition.

37. Which aspect of goal setting is most effective for enhancing sports performance?
- (a) Vague and general objectives
 - (b) Specific and measurable goals
 - (c) Unrealistic long-term targets
 - (d) Goals without deadlines

Ans :

SQP 2011

(b) Specific and measurable goals
Specific and measurable goals are most effective

in enhancing sports performance because they provide clear targets, facilitate progress tracking, and enable focused efforts. This structured approach increases motivation, directs training, and supports continuous improvement, leading to higher performance levels over time.

38. Which trait in the Big Five personality model is associated with emotional stability and low anxiety?
- (a) Neuroticism
 - (b) Conscientiousness
 - (c) Extraversion
 - (d) Low neuroticism

Ans :

COMP 2013

(d) Low neuroticism
Low neuroticism indicates emotional stability, resilience, and low anxiety levels. Athletes exhibiting this trait tend to manage stress more effectively, maintain composure under pressure, and demonstrate consistent performance, which positively impacts overall competitive behavior and outcomes.

39. Which personality trait is linked to creativity and willingness to try new experiences in sports?
- (a) Conscientiousness
 - (b) Neuroticism
 - (c) Openness
 - (d) Agreeableness

Ans :

DELHI 2015

(c) Openness
Openness is linked to creativity, curiosity, and a willingness to try new experiences. Athletes with high openness are more adaptable, embrace innovative strategies, and often excel in situations that require creative problem solving, thereby contributing positively to their sports performance.

40. According to Jung, which personality type tends to be more introspective and reserved?
- (a) Extraverts
 - (b) Introverts
 - (c) Ambiverts
 - (d) Extroverts

Ans :

OD 2019

(b) Introverts
In Jung's theory, introverts tend to be more introspective, reserved, and focused on internal thoughts and feelings. Such individuals often require solitude to recharge and may excel in

Ans :

2023

(d) Neuroticism

Explanation: Neuroticism is a personality trait marked by frequent negative emotions, such as sadness, mood swings, and anxiety. Individuals high in neuroticism experience these emotions more intensely and frequently, making this trait the best match.

3. The body structure of mesomorphic people is like

- (a) Fatty
- (b) Large muscles and bones
- (c) Solid
- (d) Obese

Ans :

BQP 2020

(b) Large muscles and bones

Mesomorphic individuals are naturally athletic with a robust physique. They have well-developed muscles and sturdy bones, making them ideally suited for physical activities and sports that require strength and power.

4. Goal setting is a _____ approach, under motivational technique.

- (a) Cognitive
- (b) Pedagogical
- (c) Social
- (d) Facilitation

Ans :

2024

(a) Cognitive

Goal setting is considered a cognitive approach because it involves mental planning, strategizing, and self-monitoring. Athletes use these mental processes to set specific, measurable objectives that direct their training and enhance their performance.

5. **Assertion (A) :** Aggression is part of human behaviour and is necessary for an individual to live and struggle for higher achievements.

Reason (R) : Aggression is inevitable and inseparable in sport activities.

In the context of the above two statements, which one of the following is correct?

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

Ans :

2023

(d) A is false, but R is true.

While aggression is inherent in sports, it is not necessary for achieving higher goals. The assertion overstates its role in personal achievement, making it false, whereas the inevitability of aggression in sports is correctly stated.

6. Aggressive behaviour of a sports person is influenced by

- (a) Emotional identification with the team
- (b) Tactical ability
- (c) Goal orientation
- (d) All of the above

Ans :

COMP 2020

(d) All of the above

Aggressive behavior in sports is multifaceted. It is influenced by emotional factors like team identification, tactical approaches to competition, and goal orientation. Each factor contributes to how aggressively an athlete performs during competition.

7. **Assertion (A) :** Intrinsic motivation has long term benefits.

Reason (R) : As factors behind it are naturally pursuing actions that provide fun, pleasure, fulfillment or challenge

In the context of the above two statements, which one of the following is correct?

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true

Ans :

2022-23

(a) Both A and R are true and R is the correct explanation of A.

Intrinsic motivation provides long-term benefits because it is driven by personal interest and enjoyment. The reason explains that activities undertaken for their inherent pleasure promote sustained engagement, validating both the assertion and its explanation.

8. Reactive Aggression is also called _____.

- (a) Instrumental Aggression
- (b) Hostile Aggression
- (c) Assertive Aggression
- (d) Both (a) and (b)

Ans :

2023-24

(b) Hostile aggression

4.3 Managing Aggression

Athletes can benefit from techniques that help regulate their aggression, including:

1. Emotional Regulation: Learning to recognize and control emotional responses under stress.
2. Mindfulness and Relaxation Techniques: These can help athletes stay focused and calm during critical moments.
3. Proper Coaching: Guidance on when and how to use aggression constructively is vital for long-term success.

5. PSYCHOLOGICAL ATTRIBUTES IN SPORTS

The mental side of sports is just as important as physical training. Several psychological attributes contribute to an athlete's ability to perform at their best under pressure.

5.1 Self-Esteem

Self-esteem refers to the confidence in one's own abilities. Athletes with high self-esteem tend to take challenges in stride and recover quickly from setbacks. They are more likely to trust their skills and push themselves to improve.

1. Importance: A strong self-image supports decision-making, risk-taking in competition, and the ability to handle criticism constructively.
2. Development: Positive reinforcement, constructive feedback, and success in practice and competition all contribute to improved self-esteem.

5.2 Mental Imagery

Mental imagery involves creating vivid, detailed mental pictures of successful performance. This technique is used to prepare the mind and body for competition.

1. Process: Athletes visualize themselves executing techniques perfectly, overcoming obstacles, and achieving their goals.
2. Benefits: This practice can reduce anxiety, enhance concentration, and build a strong neural connection between the mind and the physical execution of skills.

5.3 Self-Talk

Self-talk is the internal dialogue that athletes use to motivate themselves and stay focused during training and competition.

Types:

1. Positive Self-Talk: Involves affirmations and encouraging statements that build confidence.
2. Negative Self-Talk: Can be detrimental, leading to self-doubt and decreased performance.
3. Practice: Athletes are taught to replace negative thoughts with positive, affirming statements to maintain a focused mindset.

5.4 Goal Setting

Setting clear, measurable, and time-bound goals is essential for tracking progress and staying motivated.

1. SMART Goals:
 - (i) Specific: Clear and well-defined.
 - (ii) Measurable: Able to be tracked over time.
 - (iii) Achievable: Realistic given the athlete's capabilities.
 - (iv) Relevant: Aligned with the overall sporting objectives.
 - (v) Time-bound: Having a set timeframe to achieve them.
2. Implementation: Regularly reviewing and adjusting goals helps maintain focus and drive, ensuring that each training session has a purpose and direction.

MULTIPLE CHOICE QUESTION

Identify the characteristic of introvert personality.

- (a) Meet unknown people easily
- (b) Self-centered
- (c) Highly socialised
- (d) Expressive nature

Ans :

2024

- (b) Self-centered

Explanation: Introverts typically focus inward rather than on external social interactions. This inward focus can be misinterpreted as self-centeredness, although it primarily reflects a preference for solitude and reflection rather than active social engagement.

2. Traits like sadness, mood swings and emotional instability are related with _____.

- (a) Extroversion
- (b) Agreeableness
- (c) Conscientiousness
- (d) Neuroticism

Ans :

OD 2005

(a) Regular exercise

Explanation: Regular exercise is a key preventive measure for coronary heart disease because it improves cardiovascular health, increases blood circulation, reduces blood pressure, and helps maintain healthy cholesterol levels, thereby lowering the overall risk of heart-related illnesses.

16. Which one of the following is NOT a result of regular exercise?

- (a) Increased bone density
- (b) Increased cholesterol level.
- (c) Strong immune system.
- (d) Increased longevity.

Ans :

FOREIGN 2014

(b) Increased cholesterol level

Explanation: Regular exercise is known to improve overall health by increasing bone density, strengthening the immune system, and enhancing longevity. In contrast, exercise typically lowers cholesterol levels, not increases them, making the option incorrect as a positive outcome.

17. Normally people do not adhere to a regular exercising programme due to

- (a) lack of proper goals
- (b) adding a variety of exercises
- (c) social support enhancement
- (d) feedback from instructor

Ans :

SQP 2011

(a) Lack of proper goals

Explanation: A major reason for poor adherence to exercise routines is the absence of clearly defined, realistic goals. Without specific targets or milestones, individuals often lack the necessary motivation, structure, and direction to maintain a consistent exercise regimen.

18. Which of the following is a legitimate behaviour?

- (a) Hostile Aggression
- (b) Instrumental Aggression
- (c) Assertiveness
- (d) Proactive Aggression

Ans :

COMP 2013

(c) Assertiveness

Explanation: Assertiveness is the balanced and confident expression of one's views and feelings. It is considered a legitimate behavior because it promotes clear communication and self-expression

without resorting to hostile or destructive aggression, thereby maintaining respectful interactions in sports.

19. In instrumental aggression, the main aim is to using aggression.

- (a) cause harm to the opponent
- (b) achieve a positive goal
- (c) express your feeling of jealousy
- (d) show your hostility to an opponent

Ans :

DELHI 2016

(b) Achieve a positive goal

Explanation: Instrumental aggression is a strategic use of aggressive behavior aimed at achieving a specific objective. Rather than being an uncontrolled emotional outburst, it is measured and goal-directed, often employed to gain an advantage in competitive situations.

20. Aggression is displayed in sports through

-
- (a) assertion of views
 - (b) use of abusive words
 - (c) walking away from the opponent
 - (d) strictly following the rules

Ans :

OD2017

(b) Use of abusive words

Explanation: In sports, aggression can manifest verbally through the use of abusive language. This behavior reflects emotional tension and competitive stress, often serving as an outlet for frustration or a method of intimidating opponents during high-pressure moments.

21. Which best defines personality in sports psychology?

- (a) A transient mood state
- (b) A consistent pattern of thoughts, feelings, and behaviors
- (c) An isolated skill
- (d) A temporary motivation boost

Ans :

FOREIGN 2007

(b) A consistent pattern of thoughts, feelings, and behaviors

Personality is defined as a consistent pattern of thoughts, feelings, and behaviors that distinguishes an individual. In sports, it influences performance, decision making, and team interactions, affecting how athletes respond to challenges and achieve success consistently.

Reactive aggression is an immediate, emotion-driven response to provocation, making it synonymous with hostile aggression. This type of aggression is impulsive and rooted in negative emotions, distinguishing it from more deliberate, goal-oriented forms.

9. Personality is derived from a latin word 'persona' meaning
- Shape
 - Mask
 - Stage
 - Philosophy

Ans :

DELHI 2020

- (b) Mask

Explanation: The term "persona" originally referred to the theatrical mask worn by actors. In psychology, it symbolizes the public image or character one presents, implying that personality is the outward "mask" that represents one's inner self.

10. Which can be a suitable concept related to personality in sports?
- Stable but not unique characteristics
 - Stable and Unique characteristics
 - Unstable characteristics
 - Dynamic behaviour pattern

Ans :

OD 2018

- (b) Stable and Unique characteristics

Explanation: Personality in sports is viewed as enduring and distinct. It remains relatively constant over time and across situations, providing athletes with unique traits that influence their behavior, decision-making, and performance consistently during competitions and training.

11. A person who is bold and outgoing is an
- Introvert
 - Extrovert
 - Ambivert
 - Somatotype

Ans :

FOREIGN 2010

- (b) Extrovert

Explanation: Extroverts are known for their sociable and energetic nature. They are bold, outgoing, and thrive on social interaction, which enables them to communicate effectively and perform confidently in dynamic, competitive environments like team sports.

12. Motivation that drives individuals to naturally pursue actions that provide fun, joy, pleasure or challenge is called
- Extrinsic Motivation
 - Amotivation
 - Intrinsic Motivation
 - Cognitive Motivation

Ans :

SQP 2015

- (c) Intrinsic Motivation

Explanation: Intrinsic motivation stems from internal desires such as enjoyment, personal challenge, or satisfaction. It encourages engagement in activities for the inherent pleasure they bring, rather than for external rewards or pressures, thus fostering long-term commitment.

13. Motivation through reward or praise is known as
- Intrinsic Motivation
 - Extrinsic Motivation
 - Pedagogical Motivation
 - Facilitation Motivation

Ans :

COMP 2012

- (b) Extrinsic Motivation

Explanation: Extrinsic motivation is driven by external factors such as rewards, praise, or recognition. This type of motivation encourages individuals to perform tasks to obtain tangible benefits or social approval, rather than out of personal interest or satisfaction.

14. Which of the following is NOT a feature of Intrinsic Motivation?
- goals
 - feedback
 - needs
 - attitudes

Ans :

DELHI 2019

- (a) Goals

Explanation: Intrinsic motivation is characterized by inherent enjoyment and interest rather than the pursuit of externally defined objectives. While intrinsic factors focus on personal satisfaction and curiosity, goals typically relate to extrinsic, outcome-oriented motivation where performance is measured against set targets.

15. Which of the following is effective for prevention of Coronary Heart Disease?
- Regular exercise
 - Sedentary lifestyle
 - Medicine
 - Dieting

28. What does exercise adherence refer to in sports psychology?

- (a) The ability to perform a single exercise
- (b) The consistency in following an exercise program
- (c) The intensity of a workout session
- (d) The flexibility of an athlete

Ans :

COMP 2002

- (b) The consistency in following an exercise program

Exercise adherence refers to the consistency with which individuals follow and maintain their prescribed exercise programs over time. It is essential in sports psychology because regular participation enhances fitness, skill development, and overall performance, while also reducing injury risk and improving mental well-being.

29. Which benefit is directly associated with consistent exercise adherence?

- (a) Increased stress
- (b) Improved physical and mental health
- (c) Reduced endurance
- (d) Lower self-esteem

Ans :

DELHI 2007

- (b) Improved physical and mental health

Consistent exercise adherence is directly associated with improved physical and mental health. Regular physical activity enhances cardiovascular fitness, muscle strength, mood, and cognitive function while reducing stress levels, thereby contributing to overall well-being and long-term athletic performance.

30. Which strategy is recommended to enhance exercise adherence among athletes?

- (a) Setting vague goals
- (b) Providing social support
- (c) Ignoring progress tracking
- (d) Limiting training sessions

Ans :

OD 2003

- (b) Providing social support

Providing social support is a recommended strategy to enhance exercise adherence. Positive reinforcement from coaches, teammates, and family creates a motivating environment, encourages consistent participation, and helps athletes overcome challenges, ultimately leading to sustained commitment and improved performance.

31. In sports, aggression is best defined as:

- (a) A form of physical fitness
- (b) A deliberate behavior intended to cause harm
- (c) A measure of flexibility
- (d) An aspect of endurance

Ans :

FOREIGN 2008

(b) A deliberate behavior intended to cause harm
In sports, aggression is defined as deliberate behavior intended to cause harm or assert dominance over an opponent. It can be both functional and dysfunctional, affecting performance and outcomes. Understanding its nature is crucial for effective management and fostering fair play in competitive environments.

32. Which type of aggression in sports is goal-oriented and used to achieve a competitive advantage?

- (a) Hostile aggression
- (b) Instrumental aggression
- (c) Reactive aggression
- (d) Unintentional aggression

Ans :

SQP 2006

- (b) Instrumental aggression

Instrumental aggression is goal-oriented and deliberately used to achieve a competitive advantage in sports. It is characterized by strategic actions intended to win or control situations, contrasting with hostile aggression, which is primarily driven by emotion and personal conflict rather than performance enhancement.

33. Which type of aggression is driven by anger and emotional arousal in sports?

- (a) Instrumental aggression
- (b) Hostile aggression
- (c) Controlled aggression
- (d) Strategic aggression

Ans :

COMP 2002

- (b) Hostile aggression

Hostile aggression is driven by anger and emotional arousal, often resulting in actions that are impulsive and destructive. In sports, it may lead to unsportsmanlike behavior and penalties, thereby negatively impacting performance and team dynamics while compromising fair competition principles.

34. What does self-esteem refer to in the context of sports psychology?

- (a) An athlete's technical skills
- (b) One's overall evaluation of self-worth
- (c) A measure of speed
- (d) A method of training

and cooperative behavior.

- (b) **Relevance:** High agreeableness supports effective teamwork and sportsmanship, as athletes are more likely to support teammates and respect opponents.
- (v) **Neuroticism (Emotional Stability):**
 - (a) **Overview:** Measures the tendency toward emotional instability and anxiety.
 - (b) **Relevance:** Athletes with lower levels of neuroticism generally manage stress better, maintaining focus during high-pressure competitions.

2. MOTIVATION

Motivation is the internal engine that drives athletes to train, compete, and push their limits. It is essential not only for achieving peak performance but also for overcoming setbacks and sustaining long-term commitment.

2.1 Understanding Motivation

Motivation in sports is the psychological force that inspires athletes to pursue their goals. It can come from within or be influenced by external factors, and it shapes the intensity and persistence of an athlete's efforts. A well-motivated athlete is likely to approach challenges with determination and view setbacks as opportunities to learn and grow.

2.2 Types of Motivation

1. **Intrinsic Motivation:**
 - (i) **Definition:** Arises from personal satisfaction, passion, or the sheer joy of participating in a sport.
 - (ii) **Example:** An athlete who practices daily because they love the challenge and the feeling of mastery is driven by intrinsic factors.
 - (iii) **Impact:** Intrinsically motivated athletes are usually more resilient, as their drive comes from deep personal values and interests.
2. **Extrinsic Motivation:**
 - (i) **Definition:** Driven by external rewards such as trophies, medals, recognition, or financial incentives.
 - (ii) **Example:** An athlete who strives to win because of the prestige and rewards associated with victory exemplifies extrinsic motivation.
 - (iii) **Impact:** While effective, reliance on extrinsic motivation can sometimes wane if external rewards are removed, making it important to balance both types.

2.3 Techniques to Enhance Motivation

Athletes and coaches use various techniques to cultivate and sustain motivation:

1. **Goal Setting:**
 - (i) **Short-term and Long-term Goals:** Clearly defined, achievable targets provide direction and measurable milestones.
 - (ii) **Examples:** Breaking a season into phases, such as improving a specific skill or reaching a performance benchmark.
2. **Positive Reinforcement:**
 - (i) **Strategy:** Rewarding progress with praise, recognition, or tangible rewards to reinforce positive behavior.
 - (ii) **Examples:** Celebrating small victories or personal bests can boost an athlete's self-confidence.
3. **Self-Talk:**
 - (i) **Concept:** The practice of using affirming, positive dialogue internally to enhance confidence.
 - (ii) **Examples:** Athletes reciting phrases like "I am capable and prepared" during training sessions to counter self-doubt.
4. **Mental Imagery and Visualization:**
 - (i) **Technique:** Mentally rehearsing performances can prepare the mind for competition.
 - (ii) **Examples:** Visualizing a perfect routine or a successful play can reduce anxiety and improve focus.
5. **Creating a Competitive Environment:**
 - (i) **Approach:** Healthy competition pushes athletes to perform at their best.
 - (ii) **Examples:** Intra-team competitions or friendly matches that simulate real-game scenarios.
6. **Regular Feedback and Coaching:**
 - (i) **Method:** Constructive feedback helps athletes recognize their strengths and identify areas for improvement.
 - (ii) **Examples:** Video analysis and one-on-one sessions with coaches enhance technique and strategic thinking.

3. EXERCISE ADHERENCE

Regular exercise is key to both physical health and sports performance. However, maintaining a consistent routine can be challenging. Understanding the reasons behind exercise adherence, recognizing its benefits, and implementing strategies can make a significant difference.

sports that demand concentration, precision, and self-reflection, influencing their training and performance styles.

- 41.** What is the primary characteristic of intrinsic motivation in sports?
- Driven by external rewards
 - Motivated by personal interest and enjoyment
 - Based on monetary incentives
 - Dependent on social approval

Ans :

FOREIGN 2014

(b) Motivated by personal interest and enjoyment
Intrinsic motivation is characterized by engaging in sports for personal interest, enjoyment, and internal satisfaction rather than external rewards. Athletes with high intrinsic motivation are more likely to persist through challenges, maintain commitment, and experience genuine fulfillment in their performance and development.

- 42.** Which extrinsic reward is commonly used to motivate athletes?
- Personal pride
 - Trophies and medals
 - Inner satisfaction
 - Self-fulfillment

Ans :

SQP 2016

(b) Trophies and medals
Trophies and medals are common extrinsic rewards used to motivate athletes by providing visible recognition and external validation of their achievements. These incentives can boost performance, encourage competitive spirit, and serve as tangible goals in training and competitive sports environments.

- 43.** How does regular exercise adherence influence mental health in athletes?
- Increases anxiety and stress
 - Reduces stress and improves mood
 - Causes mood swings
 - Has no effect on mental health

Ans :

COMP 2018

(b) Reduces stress and improves mood
Regular exercise adherence positively influences mental health by reducing stress, improving mood, and enhancing cognitive function. Consistent physical activity releases endorphins, lowers anxiety levels, and promotes a sense of well-being, which is critical for maintaining optimal mental and emotional health in sports.

- 44.** Which factor does NOT typically enhance exercise adherence?
- Clear goal setting
 - Social support
 - Lack of planning
 - Regular self-monitoring

Ans :

DELHI 2020

(c) Lack of planning
Lack of planning does not enhance exercise adherence; instead, it undermines consistency and progress. Clear goal setting, social support, and regular self-monitoring are proven strategies that promote commitment, accountability, and sustained engagement in physical activities, leading to improved performance over time.

- 45.** Which type of aggression in sports is considered functional for achieving performance objectives?
- Hostile aggression
 - Instrumental aggression
 - Reactive aggression
 - Unintentional aggression

Ans :

OD 2017

(b) Instrumental aggression
Instrumental aggression is considered functional in sports because it is goal-oriented and strategically used to achieve performance objectives. Unlike hostile aggression, which is emotionally charged, instrumental aggression can be controlled and directed to improve competitive outcomes without unnecessary conflict.

- 46.** Which type of aggression is primarily driven by emotion and anger in sports?
- Instrumental aggression
 - Hostile aggression
 - Controlled aggression
 - Strategic aggression

Ans :

COMP 2004

(b) Hostile aggression
Hostile aggression is primarily driven by strong emotions such as anger and frustration. In sports, this type of aggression often leads to impulsive and destructive behaviors that can harm athletes, disrupt team dynamics, and result in penalties or injuries if not managed appropriately.

- 47.** Which psychological attribute involves the use of vivid mental images to enhance performance?
- Self-talk
 - Goal setting
 - Mental imagery
 - Concentration

reinforcement, ensuring that athletes remain engaged, consistent in training, and committed to long-term performance improvement.

- 60. Assertion (A) :** Jung's classification categorizes personality into dichotomous types such as introversion versus extraversion.

Reason (R) : The Big Five theory, in contrast, evaluates personality traits—openness, conscientiousness, extraversion, agreeableness, and neuroticism—along a continuum rather than as fixed types.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2017

- (b) Both A and R are true, but R is not the correct explanation for A

The assertion correctly describes Jung's dichotomous approach, and the reason accurately outlines the Big Five's dimensional model. However, the Big Five explanation does not directly explain Jung's method. Thus, while both statements are true, the reason is not the explanation for the assertion.

- 61. Assertion (A) :** Intrinsic motivation in sports leads to more persistent and self-determined effort compared to extrinsic motivation.

Reason (R) : Intrinsic motivation is fueled by personal satisfaction and genuine interest, making it a stronger predictor of long-term athletic engagement and performance.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2004

- (a) Both A and R are true, and R is the correct explanation for A

The assertion and the reason are both correct. Intrinsic motivation, driven by internal rewards, indeed promotes sustained effort and persistence, and the reason directly explains why such self-driven motivation benefits long-term engagement and performance in sports.

- 62. Assertion (A) :** High exercise adherence among athletes is linked to improved performance and a lower risk of burnout.

Reason (R) : Regular exercise yields benefits such as enhanced mood, increased self-discipline, and overall physical well-being, which collectively encourage consistent training participation.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2009

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is valid because sustained exercise participation improves performance and minimizes burnout. The reason accurately states that the physical and psychological benefits of regular training reinforce adherence, thus directly explaining the observed relationship between exercise adherence and performance.

- 63. Assertion (A) :** Aggression in sports can be broadly categorized into hostile aggression and instrumental aggression.

Reason (R) : Hostile aggression is driven by anger and aims to cause harm, whereas instrumental aggression is goal-oriented and used strategically to achieve a competitive advantage.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

COMP 2001

- (a) Both A and R are true, and R is the correct explanation for A

The assertion correctly divides aggression into two distinct types. The reason further elaborates by contrasting the emotional nature of hostile aggression with the calculated nature of instrumental aggression, providing a clear explanation that supports the classification stated in the assertion.

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confidence and promoting an optimistic outlook. When athletes replace negative thoughts with constructive affirmations, they improve their performance, reduce anxiety, and develop a stronger sense of self-worth in competitive environments.

- 54.** Which personality dimension of the Big Five is most directly associated with diligence and organization?

(a) Openness
(b) Conscientiousness
(c) Extraversion
(d) Agreeableness

Ans :

DELHI 2015

(b) Conscientiousness

Conscientiousness is the personality dimension most directly associated with diligence, organization, and dependability. Athletes high in conscientiousness are disciplined, goal-oriented, and methodical, which contributes to better training habits, improved performance, and consistent success in competitive sports.

- 55.** Which motivational theory distinguishes between intrinsic and extrinsic motivation?

(a) Drive theory
(b) Self-Determination Theory
(c) Maslow's hierarchy
(d) Expectancy theory

Ans :

OD 2016

(b) Self-Determination Theory

Self-Determination Theory distinguishes between intrinsic and extrinsic motivation. It explains that intrinsic motivation stems from internal satisfaction and personal interest, while extrinsic motivation is driven by external rewards. This theory helps clarify how different factors influence athletes' long-term engagement and performance.

- 56.** What is the primary effect of extrinsic motivation on athletes?

(a) It fosters internal satisfaction exclusively
(b) It encourages performance through external rewards
(c) It diminishes competitive drive
(d) It reduces training intensity

Ans :

FOREIGN 2019

(b) It encourages performance through external rewards

Extrinsic motivation encourages athletes to perform by offering external rewards such as

trophies, recognition, or financial incentives. While not always fostering internal satisfaction, it can boost performance and persistence when combined with intrinsic factors, providing clear external benchmarks for success in sports.

NODIA

- 57.** How does exercise adherence benefit overall athletic performance?

(a) It increases injury risk
(b) It promotes consistent training and recovery
(c) It reduces focus on performance
(d) It discourages routine

Ans :

SQP 2014

(b) It promotes consistent training and recovery
Exercise adherence benefits overall athletic performance by ensuring that training routines are followed consistently. This regularity enhances physical conditioning, facilitates effective recovery, builds endurance, and leads to steady improvements in strength and skill, thereby supporting optimal performance over time.

- 58.** Which aggression type in sports is generally considered counterproductive and detrimental?

(a) Instrumental aggression
(b) Hostile aggression
(c) Constructive aggression
(d) Strategic aggression

Ans :

COMP 2020

(b) Hostile aggression

Hostile aggression, driven by anger and emotional arousal, is generally counterproductive and detrimental in sports. It often results in unsportsmanlike behavior, loss of focus, and increased penalties, undermining team cohesion and potentially leading to injury or diminished performance.

- 59.** Which overall strategy is most effective in enhancing exercise adherence among athletes?

(a) Lack of feedback
(b) Supportive environment combined with clear goals
(c) Excessive criticism
(d) Random scheduling

Ans :

DELHI 2018

(b) Supportive environment combined with clear goals

A supportive environment combined with clear goals is the most effective strategy for enhancing exercise adherence. This approach provides motivation, accountability, and positive

- 90.** What is motivation, and why is it essential for sports performance? Describe two types of motivation and two techniques to enhance it.

Ans :

SQP 2004

1. Definition & Importance : Motivation is the internal drive that initiates, directs, and sustains behavior toward achieving a goal. In sports, motivation is crucial for training commitment, persistence during setbacks, and overall performance.
2. Types of Motivation:
 - (i) Intrinsic Motivation: Driven by personal satisfaction and passion for the sport.
 - (ii) Extrinsic Motivation: Influenced by external rewards such as trophies, recognition, or monetary incentives.
3. Techniques to Enhance Motivation:
 - (i) Goal Setting: Establishing specific, measurable, attainable, relevant, and time-bound (SMART) goals.
 - (ii) Positive Reinforcement: Using praise, rewards, or constructive feedback to reinforce effort and progress.

- 91.** Explain the concept of exercise adherence. List two reasons why athletes might struggle with adherence and two strategies to enhance it.

Ans :

COMP 2007

1. Concept : Exercise adherence is the extent to which an individual consistently follows a prescribed exercise regimen. It is essential for long-term performance improvement and injury prevention.
2. Reasons for Struggle:
 - (i) Lack of motivation or external support.
 - (ii) Boredom with repetitive training or overtraining leading to burnout.
3. Enhancement Strategies:
 - (i) Variety and Periodization: Introducing diverse workouts and structured training cycles to prevent monotony.
 - (ii) Social Support: Encouraging teamwork, mentorship, or group training sessions to foster accountability and enjoyment.

- 92.** Define aggression in sports and discuss its two main types.

Ans :

DELHI 2003

Aggression in sports refers to behaviors that are intended to harm or intimidate opponents, which may arise from competitive drive, frustration, or

emotional arousal.

Types of Aggression:

1. Instrumental Aggression: Aggressive actions carried out as a means to achieve a goal (e.g., a strategic foul).
2. Hostile Aggression: Aggression driven by anger or emotional arousal, often leading to unsportsmanlike conduct.

- 93.** What are the psychological attributes of sports performance? Explain how self-esteem, mental imagery, self-talk, and goal setting contribute to athletic success.

Ans :

OD 2008

1. Self-Esteem : A positive self-image enhances confidence, reduces performance anxiety, and encourages persistence.
2. Mental Imagery : Visualization techniques help athletes rehearse skills, refine techniques, and mentally prepare for competition, leading to improved execution.
3. Self-Talk : Positive internal dialogue can boost motivation, counteract negative thoughts, and reinforce focus during training and competition.
4. Goal Setting : Clear, structured goals provide direction, enable progress tracking, and help maintain motivation over time.

- 94.** How does personality influence an athlete's performance? Compare the key insights provided by Jung's classification and the Big Five theory.

Ans :

FOREIGN 2006

1. Influence : An athlete's personality affects how they handle stress, interact with teammates, and persist through challenges.
2. Jung's Classification vs. Big Five:
 - (i) Jung's Model: Focuses on dichotomies like introversion/extraversion and thinking/feeling, highlighting the inner preferences that shape behavior.
 - (ii) Big Five Theory: Provides a broader, more measurable framework (openness, conscientiousness, extraversion, agreeableness, neuroticism) that can predict performance tendencies, such as conscientiousness relating to discipline in training.

- 95.** List three benefits of high exercise adherence in sports and discuss one strategy to overcome common barriers.

- 64. Assertion (A) :** Positive self-talk in sports enhances performance by boosting focus, confidence, and reducing anxiety.

Reason (R) : Self-talk is merely a component of mental imagery and has no direct impact on performance outcomes.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

DELHI 2007

- (c) A is true but R is false

The assertion is correct—positive self-talk is proven to enhance performance by improving focus and confidence. However, the reason is false because self-talk is a distinct cognitive strategy with a direct influence on performance, not merely an aspect of mental imagery.

- 65. Assertion (A) :** Setting specific, measurable, and challenging goals improves athletic performance by providing clear targets and enhancing motivation.

Reason (R) : Vague goals offer flexibility and lower pressure, which results in better performance outcomes.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

OD 2002

- (c) A is true but R is false

The assertion is accurate; specific and challenging goals are known to drive performance improvement through enhanced focus and motivation. The reason is false because vague goals typically lead to less clarity and lower motivation, contradicting the benefits of well-defined objectives.

- 66. Assertion (A) :** Mental imagery enables athletes to rehearse performance scenarios in their mind, thereby improving execution during actual competition.

Reason (R) : Mental imagery can completely replace physical practice, making it a sufficient substitute for training.

- (a) Both A and R are true, and R is the correct explanation for A.

- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

FOREIGN 2003

- (c) A is true but R is false

The assertion is true as mental imagery is an effective tool to enhance performance by simulating competitive scenarios. However, the reason is false because mental imagery complements but does not replace physical practice, which is essential for developing sport-specific skills and conditioning.

- 67. Assertion (A) :** Implementing strategies like social support, structured programs, and goal-setting enhances exercise adherence among athletes.

Reason (R) : Social support satisfies athletes' needs for relatedness and competence, thereby boosting intrinsic motivation and reinforcing regular participation.

- (a) Both A and R are true, and R is the correct explanation for A.
- (b) Both A and R are true, but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) Both A and R are false.

Ans :

SQP 2006

- (a) Both A and R are true, and R is the correct explanation for A

The assertion is correct since adaptive strategies—such as social support and structured goal-setting—improve adherence. The reason accurately explains that fulfilling psychological needs enhances intrinsic motivation, which directly supports sustained exercise participation. Both statements are true and closely linked.

- 68. The 'O' in the Big Five Theory's OCEAN acronym stands for _____.**

- (a) Optimism
- (b) Organization
- (c) Outgoingness
- (d) Openness to Experience

Ans :

COMP 2008

- (d) Openness to Experience

The OCEAN acronym represents the five traits: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

- 69. A motivation technique where athletes are allowed to find solutions to problems themselves rather than being instructed is the _____.**

Ans :

SQP 2001

(c) Mental imagery

Mental imagery involves creating vivid, detailed mental images of successful performance. This psychological technique enhances motor skills, boosts confidence, and prepares the mind for competition by simulating game scenarios, ultimately leading to improved focus and execution during sports.

48. What does self-talk in sports primarily involve?

- (a) External coaching feedback
- (b) Internal dialogue influencing thoughts and actions
- (c) Physical training exercises
- (d) Dietary planning

Ans :

COMP 2009

(b) Internal dialogue influencing thoughts and actions

Self-talk in sports refers to the internal dialogue athletes engage in that influences their thoughts, emotions, and behaviors. Positive self-talk can build confidence, reduce anxiety, and reinforce effective strategies, while negative self-talk may undermine performance and focus during competition.

49. What is the main purpose of goal setting in sports psychology?

- (a) To create vague aspirations
- (b) To provide direction and measure progress
- (c) To discourage competitive behavior
- (d) To increase external pressure

Ans :

DELHI 2010

(b) To provide direction and measure progress

The main purpose of goal setting in sports psychology is to provide clear direction and measurable benchmarks for progress. Specific goals help athletes focus their efforts, maintain motivation, track improvements, and ultimately enhance performance through structured planning and self-regulation during training and competition.

50. Which Big Five trait is most closely related to being cooperative and compassionate in a team sport?

- (a) Neuroticism
- (b) Agreeableness
- (c) Extraversion
- (d) Conscientiousness

Ans :

OD 2013

(b) Agreeableness

Agreeableness, one of the Big Five personality traits, is associated with being cooperative, empathetic, and compassionate. In team sports, higher agreeableness facilitates positive interactions, effective communication, and harmonious collaboration, ultimately contributing to better team cohesion and collective performance.

51. Which aspect of Jung's personality theory emphasizes the role of the unconscious mind in behavior?

- (a) Extraversion
- (b) Introversion
- (c) Archetypes
- (d) Rationality

Ans :

FOREIGN 2012

(c) Archetypes

Jung's theory emphasizes archetypes, which are universal, unconscious symbols and patterns that influence behavior. These archetypes play a significant role in shaping personality, guiding athletes' responses, decision making, and creative expression in competitive sports and training environments.

52. Which motivational technique involves breaking down large goals into smaller, manageable tasks?

- (a) Cognitive restructuring
- (b) Goal setting
- (c) Self-talk
- (d) Mental imagery

Ans :

SQP 2011

(b) Goal setting

Goal setting involves breaking down large objectives into smaller, manageable tasks. This technique makes progress measurable, boosts motivation, reduces overwhelm, and allows athletes to experience consistent success, ultimately enhancing focus, confidence, and performance during training and competition.

53. Which psychological strategy has been shown to effectively enhance self-esteem in athletes?

- (a) Negative feedback
- (b) Positive self-talk
- (c) Isolation from peers
- (d) Avoiding challenges

Ans :

COMP 2005

(b) Positive self-talk

Positive self-talk is an effective psychological strategy that enhances self-esteem by reinforcing

(c)	Extroverted Sensing	(iii)	Applying logic, organizing for efficiency, and structuring.
(d)	Introverted Intuitive	(iv)	Experiencing the immediate context and taking action in the physical world.

Select the correct option from the following:

- (A) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
 (B) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 (C) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
 (D) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

Ans :

FOREIGN 2013

(C) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
 Extroverted Thinking applying logic and structuring. Introverted Feeling involves valuing based on internal truths. Extroverted Sensing is about experiencing the immediate physical context. Introverted Intuitive involves foreseeing implications without external data.

7. Match the motivation technique in List-I with the approach it belongs to in List-II.

	List-I (Technique)		List-II (Approach)
(a)	Goal Setting Theory	(i)	Pedagogical Approach
(b)	Guided Discovery Method	(ii)	Facilitation Approach
(c)	Use of Incentives/Rewards	(iii)	Cognitive Approach
(d)	Engaging family/peers	(iv)	Social Support Strategy

Select the correct option from the following:

- (A) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
 (B) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 (C) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
 (D) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

Ans :

SQP 2017

(B) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
 Goal Setting Theory is based on how people think, making it a Cognitive Approach. The Guided Discovery Method is a teaching-coaching style, part of the Pedagogical Approach. Incentives and Rewards are external factors used to motivate,

which falls under the Facilitation Approach. Engaging others is a key part of the Social Support Strategy.

78. Match the psychological attribute in List-I with its associated key concept in List-II.

	List-I (Attribute)		List-II (Key Concept)
(a)	Self-Talk	(i)	The PETTLEP framework
(b)	Mental Imagery	(ii)	Building and developing self-efficacy
(c)	Self-Esteem	(iii)	Reflects a person's physical self-image and view of their accomplishments
(d)	Goal Setting	(iv)	Task-specific statements relating to technique

Select the correct option from the following:

- (A) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
 (B) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
 (C) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)
 (D) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Ans :

COMP 2020

(C) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)
 Self-Talk includes using task-specific statements. The PETTLEP model is a popular framework for Mental Imagery. Self-Esteem is closely linked to one's physical self-image. Goal Setting is an effective technique for building self-efficacy.

79. Match the benefit of exercise in List-I with its correct description in List-II.

	List-I (Benefit)		List-II (Description)
(a)	Runners High	(i)	Positive improvement in attention control and information processing speed.
(b)	Social Cohesion	(ii)	A heightened sense of mental alertness, mood upliftment, and feeling of liberation.

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(c)	Cognitive Benefit	(iii)	Learning to lead by compensating for adverse conditions and persisting with activities.
(d)	Leadership Development	(iv)	Prevents boredom and social isolation by connecting people as teammates or group members.

Select the correct option from the following:

- (A) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
 (B) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
 (C) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
 (D) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Ans :

DELHI 2017

- (D) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Runners High is described as a feeling of liberation and heightened well-being. Social Cohesion is a benefit of group exercise that prevents isolation. Cognitive Benefits of exercise include improved attention control. Leadership Development occurs when individuals learn to handle adversity in a group setting.

80. Match the term related to aggression in List-I with its correct definition in List-II.

	List-I (Term)		List-II (Definition)
(a)	Hostile Aggression	(i)	Any behavior intended to harm or injure a living being who is trying to avoid it.
(b)	Instrumental Aggression	(ii)	Legitimate, unthreatening behavior used to express oneself.
(c)	Assertive Behavior	(iii)	Harmful behavior where the primary goal is to injure, fueled by anger.
(d)	Aggression (General)	(iv)	Harmful behavior used as a means to achieve a non-aggressive goal like winning.

Select the correct option from the following:

- (A) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (B) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
 (C) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
 (D) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

Ans :

OD 2009

- (A) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

Hostile Aggression is where the primary goal is to harm out of anger. Instrumental Aggression uses harm as a tool to achieve another goal. Assertive Behavior is positive and unthreatening. The general definition of Aggression is any behavior intended to harm.

TWO MARKS QUESTIONS

81. List down any four benefits of self talk by athletes in sports.

Ans :

2022-23

Benefits of Self-Talk:

1. Enhancing and strengthening self-belief and confidence
2. Improving the process of learning and mastering skills
3. Regulating and influencing emotional states
4. Managing and directing physical and mental efforts
5. Enhancing concentration and maintaining focus

82. What is hostile aggression?

Ans :

Delhi 2019

Hostile aggression refers to the intentional infliction of physical or psychological harm on another individual. It involves violent behavior or actions driven by anger, often accompanied by a desire to dominate or overpower the opponent, without any strategic or goal-oriented purpose.

83. Define aggression. Discuss any 2 types of aggression.

Ans :

2023

Aggression is defined as a form of interpersonal behavior aimed at intentionally causing physical harm or psychological distress to one or more individuals.

Types of Aggression:

1. Direct Aggression: Involves face-to-face confrontations where an athlete may verbally abuse, physically harm, or directly insult someone through words or actions.
2. Indirect Aggression: Involves harming others subtly, such as through gossip, spreading rumors, or making negative remarks behind someone's back.

84. Differentiate between introvert and extrovert personality.

Ans :

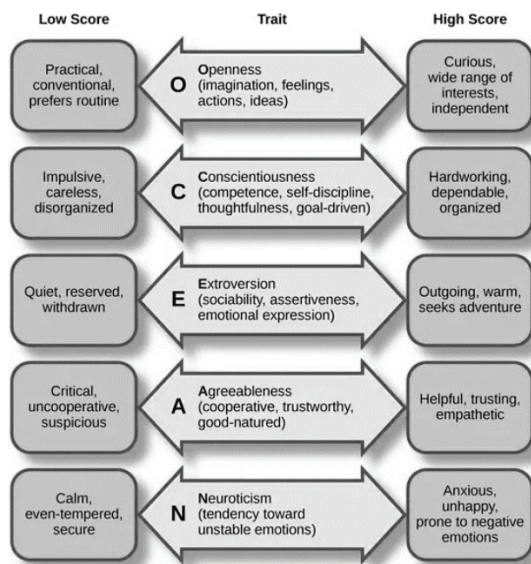
2023-24

Introvert	Extrovert
Interested in their own self reserved	Highly socialized broadminded
Self-aware and introspective take pleasure in reading, writing tend to shy away from public	Expressive and enjoy centre of attention meet unknown people easily
Think before acting	Action oriented

85. Explain any three personality types of Big five theory.

Ans :

Term-II, 2021-22



86. Explain the cognitive aspect of stress. Suggest any three techniques briefly to overcome stress.

Ans :

AI 2015

Stress impacts various memory functions and cognitive processes in the brain. It can influence

performance, with stress hormones affecting areas related to learning, memory, and neural plasticity. Prolonged stress may alter brain structure and cognitive abilities.

Coping strategies can be categorized in multiple ways, one common classification being problem-focused coping and emotion-focused coping.

87. “Extrinsic motivation sometimes may kill intrinsic motivation.” Justify.

Ans :

Term-II, 2021-22

Extrinsic motivation can sometimes diminish intrinsic motivation, as an athlete engages in and continues an activity due to external incentives, rewards, or pressures. Over time, if these external rewards are no longer available, the athlete may lose interest and eventually withdraw from the sport.

88. Explain Intrinsic motivation.

Ans :

AI 2015

Intrinsic motivation is the internal drive to engage in an activity for personal satisfaction and enjoyment, rather than for external rewards or fear of punishment. Unlike extrinsic motivation, which is driven by external incentives, intrinsic motivation arises from a genuine interest in the activity, seeing it as a chance to explore, learn, and realize one's potential.

89. Define personality and explain its significance in sports. Briefly describe Jung's classification of personality types and the Big Five theory.

Ans :

FOREIGN 2001

1. Definition & Significance : Personality refers to the enduring patterns of thoughts, feelings, and behaviors that distinguish an individual. In sports, personality influences how athletes cope with pressure, interact with teammates, and maintain consistency under stress.
2. Jung's Classification : Jung proposed that personalities are determined by preferences in perceiving the world (e.g., sensation vs. intuition) and making decisions (e.g., thinking vs. feeling). His theory also introduces the concepts of introversion and extraversion.
3. Big Five Theory : The Big Five model describes personality in terms of five broad dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. These traits help predict athletes' behavior, stress management, and teamwork.

method.

- (a) Goal Setting
- (b) Guided Discovery
- (c) Reinforcement
- (d) Fun-based Training

Ans :

DELHI 2011

- (b) Guided Discovery

The Guided Discovery Method is described as a pedagogical approach where athletes are motivated by being allowed to find solutions on their own.

- 70.** Goals that focus on the final result of a sporting event, such as winning a championship, are known as _____ goals.

- (a) performance
- (b) process
- (c) outcome
- (d) product

Ans :

OD 2018

- (c) outcome

Outcome goals giving priority and importance to the final outcome of a sporting event, such as winning.

- 71.** The PETTLEP model, which includes elements like Physical, Environment, and Task, is a framework used for structuring _____ interventions for athletes.

- (a) self-talk
- (b) motivation
- (c) mental imagery
- (d) goal setting

Ans :

FOREIGN 2010

- (c) mental imagery

The PETTLEP model is a popular framework used to devise effective mental imagery interventions for athletes.

- 72.** The 'stickability' factor, or the ability to continue with a voluntary exercise program over a prolonged period, is referred to as _____.

- (a) motivation
- (b) exercise adherence
- (c) persistence
- (d) self-discipline

Ans :

SQP 2012

- (b) exercise adherence

Exercise adherence is defined as maintaining active involvement in exercise and relates it to the "stickability" factor.

- 73.** A person who falls in the middle of the introvert/extrovert continuum, blending traits from both, is known as an _____.

- (a) ambivert
- (b) extrovert
- (c) introvert
- (d) mesomorph

Ans :

COMP 2005

- (a) ambivert

The concept of an ambivert as someone who falls in the middle of the introvert/extrovert scale and reflects a blend of traits from both.

- 74.** The cognitive approach to motivation includes the Expectancy theory and the _____ theory.

- (a) Drive
- (b) Inverted-U
- (c) Social Learning
- (d) Goal Setting

Ans :

DELHI 2014

- (d) Goal Setting

The cognitive approach to motivation and explicitly names Expectancy theory and Goal Setting theory as widely used examples.

- 75.** _____ aggression is a calculated and planned harmful action that has a motive other than just harming someone, such as gaining a competitive advantage.

- (a) Hostile
- (b) Instrumental
- (c) Assertive
- (d) Proactive

Ans :

OD 2019

- (b) Instrumental

Instrumental aggression is a aggressive behavior used to attain a non-aggressive goal, such as winning, rather than being fueled by anger.

- 76.** Match the Jungian personality type in List-I with its correct description in List-II.

List-I (Personality Type)		List-II (Description)	
(a)	Extroverted Thinking	(i)	Valuing something based on internal truths and its worth.
(b)	Introverted Feeling	(ii)	Foreseeing implications and possibilities without external data.

Ans :

SQP 2002

1. Benefits:
 - i. Consistent improvement in physical performance.
 - ii. Reduced risk of injury due to well-planned recovery and training balance.
 - iii. Enhanced overall well-being and mental resilience.
2. Strategy to overcoming Barriers : Incorporate a varied training schedule with clear, progressive goals to keep the routine engaging and to prevent burnout.

96. In what ways can aggressive behavior manifest in sports, and what measures can be implemented to control it?

Ans :

COMP 2010

1. Manifestations : Aggressive behavior can range from intentional fouls to unsportsmanlike conduct or verbal altercations.
2. Control Measures :
 - i. Education and Training: Programs on emotional regulation and conflict resolution.
 - ii. Rule Enforcement: Strict penalties and disciplinary actions to deter aggressive behavior, promoting a culture of respect and fair play.

97. How do mental imagery and self-talk enhance performance? Discuss with an example from a sport of your choice.

Ans :

DELHI 2012

1. Mental Imagery : Athletes visualize successful performances to build confidence and improve execution. For instance, a gymnast might mentally rehearse a routine to perfect each movement.
2. Self-Talk : Positive self-talk helps to refocus attention and manage anxiety. A tennis player might use affirmations like "I am strong" to overcome pressure during a match.

98. Define personality in the context of sports psychology. How do the Big Five traits manifest in an athlete's behavior?

Ans :

OD 2005

Personality in sports refers to the consistent behavioral patterns and mental traits that influence how athletes approach training, competition and teamwork.

Big Five Traits Manifestation:

1. Openness : Creativity in strategy and willingness to try new techniques.
2. Conscientiousness : Discipline in training routines and attention to detail.
3. Extraversion : Energy and positive interactions with teammates and supporters.
4. Agreeableness : Cooperative behavior and sportsmanship.
5. Neuroticism : How athletes cope with stress and setbacks; lower levels are generally associated with better stress management.

99. Discuss the role of motivation in achieving peak performance and describe two techniques that athletes use to enhance motivation.

Ans :

FOREIGN 2011

1. Role of Motivation : Motivation is the driving force behind consistent training, overcoming challenges, and striving for excellence.
2. Techniques:
 - i. Visualization (Mental Imagery): Athletes visualize success and rehearse their performance, which builds confidence and improves focus.
 - ii. Goal Setting: Creating short-term and long-term goals helps to structure training, monitor progress, and sustain motivation through measurable achievements.

100. What is exercise adherence and why is it particularly important in sports training? Provide one strategy that coaches can use to enhance adherence among athletes.

Ans :

SQP 2013

Exercise adherence refers to the commitment to follow a structured training regimen consistently. It is critical for building fitness, improving skills, and preventing injuries.

Strategy for Enhancement : Tailoring workouts to meet individual needs and preferences increases engagement, makes training enjoyable, and enhances adherence by setting realistic goals.

101. Explain the concept of aggression in sports. How can distinguishing between instrumental and hostile aggression benefit coaches and athletes?

Ans :

COMP 2015

1. Concept of Aggression : Aggression in sports encompasses behaviors that may lead to physical or verbal confrontations, which can either be strategic or emotionally driven.

in a subjective and creative manner. Their interpretations stem from internal knowledge, deep reflection, and personal understanding rather than external validation. They seek logical coherence within their own thoughts and rely on introspection to form conclusions. Individuals inclined toward introverted thinking often excel in disciplines like philosophy and theoretical science, where abstract reasoning and independent analysis play a crucial role.

Jung's theory highlights that both introversion and extroversion contribute uniquely to personality, shaping how individuals think, interact, and engage with their surroundings. These attitudes function as opposing yet interconnected forces that influence human behavior.

- 134.** Explain Sheldon's classification of personality and explain its importance in physical education and sport.

Ans :

Delhi 2015

William Sheldon classified personality types based on physical structure and identified three primary body types, each associated with distinct psychological traits.

1. **Endomorph :** An endomorphic body type, also called visco-elastic, is characterized by a rounded physique. These individuals have wide hips, narrow shoulders, and a pear-shaped body. They tend to store extra fat, particularly on their arms and thighs, with thin ankles and wrists, making their body appear larger.

Psychological Traits of Endomorphs:

- i. Sociable and fun-loving
- ii. Enjoy eating and seek comfort
- iii. Tolerant and even-tempered
- iv. Good-humored and relaxed in their approach to life
- v. Constantly seek affection, love and reassurance

2. **Ectomorph :** An ectomorphic body type is the complete opposite of an endomorph. These individuals are slim and lean, with narrow shoulders, a thin frame, long limbs, and very little body fat. They tend to have a narrow face and chest and often struggle to gain weight despite consuming large amounts of food.

Psychological Traits of Ectomorphs:

- i. Self-conscious and introverted
- ii. Prefer privacy and are socially reserved

- iii. Emotionally restrained and thoughtful
- iv. Often artistic and intellectually inclined
- v. Intense and may experience social anxiety

3. **Mesomorph :** A mesomorphic body type falls between endomorphs and ectomorphs. These individuals have a muscular and athletic build, with broad shoulders, a narrow waist, strong arms and legs, and minimal body fat. They naturally develop muscle mass and are well-suited for physical activities.

Psychological Traits of Mesomorphs:

- i. Adventurous and courageous
- ii. Confident and assertive
- iii. Indifferent to others' opinions
- iv. Enthusiastic about physical activity and competition
- v. Natural risk-takers with a strong desire for power and dominance
- vi. Often excel in leadership roles

Sheldon's theory suggests that body type influences personality, shaping how individuals behave, interact, and approach challenges in life.

- 135.** Elaborate on the Big Five Theory of personality. For each of the five traits (OCEAN), describe the characteristics of an individual who scores high and explain its potential impact on their engagement and performance in sports.

Ans :

OD 2009

The Big Five Theory is a prominent trait approach to understanding personality, often referred to by the acronym OCEAN. It suggests that personality can be understood through five broad domains or dimensions. The characteristics of an individual who scores high in each trait and their impact on sports are as follows:

1. **Openness to Experience:** A person scoring high in this trait is imaginative, humorous, intellectual, creative, and open to new ideas and experiences. In sports, these athletes are often innovative, willing to try new techniques or strategies, and can adapt well to changing game situations. They may be drawn to sports that require creativity and problem-solving.
2. **Conscientiousness:** This trait describes individuals who are well-organized, careful, responsible, hardworking, and dependable. This is highly beneficial in sports, as conscientious athletes are disciplined in their

THREE MARKS QUESTIONS

107. Define personality and motivation.

Ans :

Term-II, 2021-22

1. Personality
 - i. Begge and Hunt: Personality is the complete pattern of behavior exhibited by an individual, reflecting the entirety of their characteristics.
 - ii. Sigmund Freud: Personality comprises the unique thoughts, feelings, and behaviors of an individual that remain consistent over time and across different situations.
2. Motivation
 - i. Morgan and King: Motivation is an internal state in a person or animal that propels behavior towards a specific goal.
 - ii. Johnson: Motivation influences and directs the overall pattern of activities that characterize an organism's behavior.

108. List down and briefly explain any four techniques of motivation.

Ans :

Term-II, 2021-22

1. Goal Setting : Motivation improves when individuals set specific, time-bound goals with clear purposes. Such goals direct focus and energy toward achieving measurable outcomes within a set period.
2. Guided Discovery Method : Athletes are more motivated when they discover solutions on their own rather than simply following instructions. This method encourages independence and cooperation, fostering deeper engagement.
3. Incentives and Rewards : External rewards such as trophies, prize money, praise, or recognition can enhance motivation, especially when intrinsic drive is low. These rewards provide tangible reasons to remain consistent in sport or exercise.
4. Social Support : Encouragement from family, friends, and peers strengthens commitment. Supportive environments—especially those involving group activities—help individuals build positive habits and stay motivated over time, reinforcing participation and consistency in physical activity.

109. Write short note on Goal setting.

Ans :

2023-24, 2023

Goal setting is a mental training strategy designed to enhance an individual's commitment by defining a specific level of performance to be achieved within a predetermined time frame. This process involves establishing a performance benchmark that must be reached by a set deadline. It has demonstrated effectiveness in improving performance and productivity across various settings—ranging from employee exercise programs and competitive sports to industrial organizations—while also boosting self-efficacy and imbuing the task with intrinsic value.

110. How can we enhance the sports performance with the help of self-talk and self-esteem? Explain.

Ans :

2023

Improving self-esteem involves eliminating negative self-talk, recognizing your strengths and self-worth, and accepting mistakes and even rejection. Adopting a positive, optimistic attitude helps foster a healthier lifestyle.

In sports, athletes use self-talk during training and competition by saying things like “keep going,” “focus on form,” or repeating mantras such as “I’m feeling strong.” Self-talk in sports serves two main purposes: enhancing motivation and encouraging increased effort.

111. What are the personality traits according to the Big Five Theory?

Ans :

Term-II, 2021-22

Lewis R. Goldberg, an American personality psychologist, introduced the “Big Five” personality traits—also known as the five-factor model (FFM). This model is based on descriptive terms that capture the essence of personality, suggesting five broad dimensions that are commonly used to define human personality and psyche. The Big Five model has inspired extensive research across diverse populations. A popular way to remember these traits is by using the acronym “OCEAN,” which represents the following factors:

Openness to Experience: Referring to intellect and imagination, this trait reflects an individual's willingness to explore new ideas, embrace novel experiences, be open to vulnerability, and think creatively outside conventional boundaries.

1. Conscientiousness
2. Extraversion
3. Agreeableness
4. Neuroticism

within fair play limits.

By managing aggression effectively, athletes can maintain intensity without compromising sportsmanship.

- 121.** (a) What are the reasons people fail to adhere to an exercise routine?
 (b) Suggest effective strategies to overcome these challenges.

Ans :

COMP 2020

- (a) Reasons for Failure:
- Lack of motivation or clear fitness goals.
 - Physical discomfort or fear of injury.
 - Busy schedules and work-life balance struggles.
- (b) Strategies to Overcome Challenges:
- Personalized Workout Plans: Designing enjoyable and goal-specific exercise routines.
 - Accountability Measures: Using fitness apps or workout partners to stay consistent.
 - Incorporating Fun Activities: Engaging in sports or group workouts to make exercise enjoyable.

These strategies help individuals sustain long-term fitness habits.

- 122.** According to the Big Five Theory of personality, explain the traits of 'Conscientiousness' and 'Neuroticism' and discuss their relevance in sports.

Ans :

SQP 2017

The Big Five Theory includes five key personality traits. Two of these are:

- Conscientiousness :** This trait refers to individuals who are well-organized, careful, responsible, hardworking, and dependable. In sports, athletes high in conscientiousness often excel, as this trait is positively correlated with better performance in tasks requiring planning, organization, and sound decision-making abilities.
- Neuroticism :** This trait focuses on emotional stability. An individual with high neuroticism tends to be nervous, anxious, and excitable, while someone with low neuroticism is typically calm and composed. This is highly relevant in sports, as athletes with high emotional stability (low neuroticism) are better able to handle competitive pressure, while high neuroticism can lead to performance-hindering anxiety.

- 123.** Define motivation in the context of sports psychology. Differentiate between intrinsic and extrinsic motivation, providing an example of each for an athlete.

Ans :

DELHI 2007

In sports psychology, motivation is defined as the process that initiates, guides, and maintains behavior over time. It is the driving force that explains the direction and intensity of an athlete's effort.

The two primary types of motivation are:

- Intrinsic Motivation:** This is an internal drive to perform an activity for the pure enjoyment, challenge, or satisfaction it provides. An example is a basketball player who practices for hours simply because they love the feeling of mastering a new skill.
- Extrinsic Motivation:** This drive comes from external sources, where behavior is influenced by the desire to earn a reward or avoid punishment. An example is a sprinter who trains hard specifically to win prize money or a gold medal.

- 124.** What is exercise adherence? Briefly explain any three strategies that can be used to enhance adherence to an exercise program.

Ans :

OD 2010

Exercise adherence refers to the extent to which an individual maintains active and voluntary involvement in a physical exercise program over a prolonged period. It is the "stickability" factor that enables a person to continue with their routine despite pressures to stop.

Three strategies to enhance exercise adherence are:

- Goal Setting:** Setting goals that are Specific, Measurable, Attainable, Realistic, and Time-based (SMART) provides direction and focus, which helps maintain motivation.
- Adding Variety:** To prevent boredom, which often leads to dropping out, it is effective to add a variety of new exercises, methods, and equipment to the routine.
- Social Support:** Exercising with friends, family, or a group can increase motivation and accountability. Creating a "buddy system" or joining group activities helps make exercise a positive social experience, which enhances long-term adherence.

- 116.** Discuss the importance of psychological attributes in sports performance, focusing on self-esteem, mental imagery, and goal setting.

Ans :

COMP 2018

Psychological attributes play a crucial role in sports success:

1. **Self-Esteem:** A high sense of self-worth boosts confidence, allowing athletes to perform under pressure.
2. **Mental Imagery:** Visualization techniques help athletes mentally rehearse actions, improving execution and reaction times.
3. **Goal Setting:** Establishing clear, measurable, and achievable goals enhances motivation and provides direction for improvement.

Athletes who cultivate these attributes can maintain focus, resilience, and consistency in their performance.

- 117.** (a) How does self-talk influence an athlete's performance?
(b) Provide an example of positive self-talk and its impact during competition.

Ans :

DELHI 2004

- (a) **Influence of Self-Talk :** Self-talk refers to internal dialogue that affects an athlete's confidence and concentration. Positive self-talk reduces anxiety, enhances motivation, and improves focus, while negative self-talk can lower performance by increasing doubt and stress.
- (b) **Example & Impact:**
- i. **Example:** A sprinter saying, "I am fast and strong, I will finish strong" before a race.
 - ii. **Impact:** This boosts self-belief, maintains composure under pressure, and enhances performance by fostering a winning mindset.

Integrating positive self-talk in training and competition significantly benefits mental resilience and overall success.

- 118.** Explain the Big Five Theory of personality and its relevance in sports psychology.

Ans :

SQP 2002

The Big Five Theory categorizes personality traits into five dimensions:

1. **Openness:** Willingness to try new experiences. In sports, this may influence adaptability to different training methods.

2. **Conscientiousness:** Discipline and goal orientation; crucial for athletes who require strong focus and self-regulation.
3. **Extraversion:** Sociability and enthusiasm, often found in team sports players.
4. **Agreeableness:** Cooperation and empathy, essential for teamwork and sportsmanship.
5. **Neuroticism (Emotional Stability):** Lower neuroticism leads to better stress management under competitive pressure.

This theory helps coaches and psychologists tailor motivation and training techniques based on an athlete's personality traits.

- 119.** What are some common motivation techniques used by coaches to enhance sports performance?

Ans :

DELHI 2013

Coaches use various motivation techniques to maximize performance:

1. **Positive Reinforcement:** Praise, rewards, and recognition to encourage desired behaviors.
2. **Goal Setting:** Breaking down long-term objectives into smaller, manageable goals to maintain motivation.
3. **Visualization:** Encouraging athletes to mentally rehearse successful performances to build confidence.
4. **Competition & Challenges:** Creating simulated game situations in practice to keep training engaging.
5. **Constructive Feedback:** Providing detailed, encouraging feedback to help athletes refine skills.

Using these techniques ensures that athletes stay motivated and consistently strive for improvement.

- 120.** How does aggression impact sports performance, and what are ways to manage excessive aggression?

Ans :

OD 2016

1. **Impact on Performance :** Controlled aggression can enhance competitiveness and assertiveness, leading to better outcomes. Excessive aggression may lead to penalties, injuries, or psychological stress.
2. **Ways to Manage Excessive Aggression:**
 - i. **Relaxation Techniques:** Deep breathing and meditation to calm nerves.
 - ii. **Cognitive Restructuring:** Reframing aggressive thoughts into constructive strategies.
 - iii. **Referee & Rule Enforcement:** Strict penalties ensure aggression remains

- 112.** Define personality in the context of sports psychology. Explain the Jung Classification of personality types and how these traits may influence athletic performance.

Ans :

SQP 2009

Personality refers to an individual's characteristic patterns of thought, emotion, and behavior that influence their responses to various situations, including sports performance.

Jung's Classification of Personality:

1. Introverts: Reserved, thoughtful, and prefer individual sports like chess, archery, or long-distance running, where minimal external interaction is needed.
2. Extroverts: Outgoing, energetic, and thrive in team sports like football, basketball, or hockey, where social interaction and high-energy engagement are required.

Understanding an athlete's personality can help coaches tailor training approaches, motivate players effectively, and optimize performance by aligning activities with their natural tendencies.

- 113.** What is motivation in sports? Differentiate between intrinsic and extrinsic motivation with suitable examples.

Ans :

COMP 2003

Motivation is the internal or external drive that compels an athlete to engage in physical activity, training, or competition.

1. Intrinsic Motivation : Comes from within an individual, driven by personal satisfaction and the love of the sport.
Example: A marathon runner who trains diligently because they enjoy the challenge and personal growth.
2. Extrinsic Motivation : Comes from external rewards such as medals, trophies, or financial incentives.
Example: A professional football player working hard to secure a contract renewal and monetary benefits.

Both types play a crucial role in sustaining an athlete's commitment to training and improving performance.

- 114.** Why do people find it difficult to adhere to an exercise routine? Discuss three benefits of exercise adherence and strategies to enhance it.

Ans :

DELHI 2012

1. Reasons for Difficulty:

- i. Lack of Time: Busy schedules make consistent workout routines challenging.
 - ii. Low Motivation: Without clear goals or immediate rewards, individuals may lose interest.
 - iii. Boredom or Lack of Variety: Repetitive exercises may lead to disinterest and discontinuation.
2. Benefits of Exercise Adherence:
 - i. Improved Physical Health: Regular exercise reduces the risk of chronic diseases like diabetes and heart issues.
 - ii. Enhanced Mental Well-being: Releases endorphins, reducing stress and anxiety.
 - iii. Better Athletic Performance: Consistency improves strength, endurance, and overall fitness.
 3. Strategies for Enhancing Adherence:
 - i. Setting Realistic Goals: Short-term, achievable targets keep individuals motivated.
 - ii. Social Support: Engaging in group workouts or fitness communities enhances accountability.
 - iii. Variety in Exercise: Alternating workout routines prevents monotony and sustains interest.

- 115.** (a) Define aggression in sports and discuss its types.
(b) Provide examples of both positive and negative aggression in sports situations.

Ans :

OD 2019

- (a) Definition & Types of Aggression : Aggression in sports refers to forceful or assertive behavior directed at achieving a competitive advantage. It can be categorized as:
- i. Hostile Aggression: Intent to harm an opponent, often leading to penalties or disqualification.
 - ii. Instrumental Aggression: Goal-directed aggression used within the rules of the game to enhance performance.
- (b) Examples:
- i. Positive Aggression (Instrumental): A rugby player making a strong but legal tackle to regain possession of the ball.
 - ii. Negative Aggression (Hostile): A boxer deliberately punching an opponent after the referee has called a break, resulting in a foul.

- 125.** Differentiate between hostile and instrumental aggression in sports, providing a clear example for each type of behavior.

Ans :

COMP 2015

Both hostile and instrumental aggression involve the intent to harm, but their primary goals differ.

1. Hostile Aggression is a violent, angry, and impulsive behavior where the primary goal is to harm another person. It is often a reaction to a perceived threat or insult and is fueled by intense emotion rather than a strategic objective. An example is a soccer player purposefully punching an opponent out of anger after being tackled.
2. Instrumental Aggression is a calculated, harmful behavior used as a means to achieve a non-aggressive goal, such as winning. The intent is to harm, but it is a strategic action, not driven by anger. An example is a hockey player deliberately elbowing a star opponent to injure them and remove them from the game, thereby increasing their own team's chances of winning.

- 126.** What is self-talk? Describe any two ways in which athletes can use self-talk to improve their performance.

Ans :

SQP 2001

Self-talk is the internal or overt personal dialogue in which an athlete interprets feelings and gives themselves instructions and reinforcement. It is an effective technique for controlling thoughts and influencing feelings, which in turn affects self-confidence and performance.

Athletes can use self-talk to improve performance in several ways:

1. Skill Acquisition: Learning a new skill requires persistence and effort. Using positive self-talk phrases like "I can do this" or "stay focused" helps an athlete continue working hard, break bad habits, and learn new techniques effectively.
2. Creating and Changing Mood: Using specific "mood words" can help an athlete increase their arousal and create a desired emotional state. For example, a sprinter might use words like "go" or "explode" to precipitate a powerful start, using their thoughts to generate a motivating feeling.

- 127.** Explain the concept of 'mental imagery' as a psychological attribute in sports. Describe the difference between internal and external imagery.

Ans :

DELHI 2006

Mental imagery is a psychological skill where an athlete uses their senses to create or recreate an experience or visual image in their mind. This mental rehearsal can feel as real as the actual event and is used to enhance performance, manage stress, and learn skills.

Sport psychologists distinguish between two types of imagery:

1. Internal Imagery: In this form, the athlete views themselves performing from inside their own body. They experience the sensations of the movement as if they are actually doing it. This is particularly effective for the mental rehearsal of techniques.
2. External Imagery: In this form, the athlete pictures themselves performing from an outside perspective, as if they are watching a video of themselves. This can be useful for analyzing form and strategy.

- 128.** What is self-esteem in the context of sports? Explain how regular participation in sports and exercise can positively influence an athlete's self-esteem.

Ans :

OD 2011

In sports, self-esteem refers to an athlete's evaluation of or attitude toward themselves, centered on their belief in and respect for their own capabilities. It includes their physical self-image, their view of their accomplishments, and the esteem they receive from others, such as coaches and teammates.

Regular participation in sports and exercise is strongly associated with increases in self-esteem. As athletes learn new skills, see their bodies become stronger, and achieve performance goals, their confidence and feeling of self-worth grow. This is especially true for the physical dimension of self-esteem, where athletes judge their own bodies more positively compared to others. The pursuit of self-esteem is a powerful motive for many athletes and exercisers.

- 129.** (a) What are the two main personality attitudes described in Carl Jung's classification?
(b) Briefly describe the characteristics of an 'Introvert' and an 'Extrovert'.

Ans :

SQP 2014

- (a) Carl Jung's theory of personality classifies people based on two primary personality attitudes. These are Introversion and Extraversion. He proposed that people tend to focus their energy and attention either on their inner world of ideas or the outer world of people and things.
- (b) The characteristics of these two attitudes are:
- Introvert: An introvert is a person who is predominantly interested in their own mental self. They are typically seen as more reserved, reflective, and self-aware. They often take pleasure in solitary activities like reading and tend to think carefully before acting.
 - Extrovert: An extrovert is the opposite, preferring the outer world of people and things. They are typically bold, outgoing, optimistic, and highly socialized. They enjoy being the center of attention and thrive in group activities and large social gatherings.

- 130.** (a) List three cognitive benefits and three mental health benefits of regular exercise.
- (b) Briefly explain how exercise can act as a therapy for emotional disorders.

Ans :

DELHI 2016

- (a) Regular exercise provides numerous psychological benefits.
- Cognitive Benefits:**
- Improved Attention Control: Regular physical activity helps improve attention and concentration.
 - Enhanced Memory: Exercise can improve brain function and protect memory and thinking skills.
 - Faster Information Processing: Aerobic activities have been shown to lead to a positive improvement in the speed of information processing.
- Mental Health Benefits:**
- Stress Relief: Physical activity is an effective way to cope with stress and tension.
 - Increased Happiness: Exercise increases the production of endorphins, which produce positive feelings and improve mood.
 - Reduces Depression and Anxiety: Exercise is an effective intervention for

managing and reducing symptoms of depression and anxiety.

- (b) Exercise can act as a therapy for emotional disorders because it has a direct positive impact on mood and self-esteem. Physical activity increases blood flow to the brain and stimulates the production of hormones like endorphins, which create a feeling of happiness and well-being. For people suffering from depression and anxiety, exercise provides an effective intervention that can lead to an improved mood, enhanced self-esteem, and a greater sense of control, thereby increasing their overall productivity and quality of life.

- 131.** (a) What are the three main types of goals athletes focus on in sports?

- (b) Explain the SMART principle for effective goal setting.

Ans :

COMP 2019

- (a) In sports, athletes typically focus on three main types of goals to enhance performance:
- Outcome Goals: These focus on the final result of an event, such as winning a championship or earning a medal.
 - Performance Goals: These focus on an athlete's own achievements, independent of others, such as achieving a personal best time or scoring a certain number of points.
 - Process Goals: These focus on the specific behaviors and techniques required to execute a task effectively, such as maintaining correct form during a lift.
- (b) The SMART principle is an acronym used to guide effective goal setting.
- S Specific: Goals must be clear and focused (e.g., "improve free-throw accuracy to 80%").
 - M Measurable: Goals must be quantifiable so that progress can be tracked.
 - A Action-Oriented: Goals must have clear action steps detailing what needs to be done.
 - R Realistic: Goals must be challenging yet attainable to maintain motivation.
 - T Timely: Goals must have a defined timeline or deadline.

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FIVE MARKS QUESTIONS

- 132.** Discuss in details any three techniques of motivation.

Ans :

SQP 2020

Motivation is the process of inspiring individuals to take action and work toward achieving desired objectives. It represents an internal feeling—the urge, drive, desire, or aspiration that influences human behavior. It typically begins with one or more unmet needs and culminates in their satisfaction, thereby producing goal-directed behavior. In sports, athletes can be motivated to reach a certain level of individual or team performance.

1. **Goal Setting :** Athletes should be encouraged to establish a few ambitious yet attainable long-term goals, such as representing their country in a major championship within three to four years. By empowering athletes to set their own goals, they are more likely to embrace upcoming challenges and pursue their objectives with enthusiasm. Long-term goals must be both aspirational and realistic, while medium-term goals serve to keep individuals or teams focused on these long-term aspirations. Short-term goals are crucial for honing focus, conditioning, technique, and performance. Additionally, goals should be regularly monitored and revised. The goal-setting process is most effective when athletes or teams take ownership of their goals and when progress can be measured.
2. **Motivational Rewards :** Effective use of extrinsic rewards reinforces an athlete's sense of competence and self-worth. For a reward to be truly motivating, it should have minimal monetary value—examples include titles like “Man of the Match” or “Athlete of the Tour.” Such rewards are best presented publicly to highlight the associated prestige. Another popular method is to have athletes' names etched on annual honor boards, serving as token rewards that bolster motivation.
3. **Motivational Music :** Using music that athletes find inspirational is an excellent method to boost motivation during training and before competitions. Different types of music can be employed at various stages of training to regulate work and recovery periods. Research shows that this approach can increase work

output, reduce the perception of exertion, and enhance the enjoyment of the activity. It is important that the motivational music:

Matches the practice rhythm,

Cultivates a mindset of “I can do anything” among team members, and

Is utilized whenever the opportunity arises.

4. **Positive Self-Talk :** Positive self-talk is a technique that leverages an athlete's inner dialogue to enhance motivation across various sports activities. By reinforcing self-esteem and critical aspects of performance, repeated positive self-talk can effectively reshape an athlete's belief system and foster improved performance.

- 133.** What are the different dimensions of personality? Write in brief about any two.

Ans :

Delhi 2017

Personality refers to the unique patterns of thinking, feeling, and behaving that differentiate individuals. It encompasses moods, attitudes, and opinions that are expressed through interactions with others. Personality includes both inherent and acquired behavioral traits that distinguish one person from another. These characteristics influence how individuals relate to their environment and social groups.

Carl Jung introduced eight personality dimensions, emphasizing Introversion and Extroversion Attitudes. According to Jung, an attitude refers to a person's natural tendency to behave in a specific way. He identified two contrasting yet complementary attitudes: introversion and extroversion. These attitudes influence how individuals perceive and interact with the world.

Carl Jung's Introversion and Extroversion Attitudes

1. **Extroverted Thinking :** Individuals with extroverted thinking understand the world through a combination of concrete and abstract ideas. However, the abstract concepts they rely on are typically derived from external sources, such as knowledge passed down by others. They prioritize logical analysis, objectivity, and structured reasoning. Extroverted thinkers are commonly found in fields like research sciences and mathematics, where systematic and rational thought processes are essential.
2. **Introverted Thinking :** Those with introverted thinking process external stimuli

2. Distinguishing Benefits:

- i. Instrumental Aggression : Recognizing that some aggressive behaviors are used strategically (e.g., a tactical foul) can help coaches train athletes to control such actions within the rules.
- ii. Hostile Aggression : Identifying when aggression is emotionally driven enables intervention through psychological training, stress management, and anger control techniques to reduce harmful behaviors.

102. How does understanding one's personality help athletes in managing competitive stress? Compare insights from Jung's and the Big Five approaches.

Ans :

DELHI 2019

1. Managing Stress : Awareness of personality traits helps athletes identify stress triggers and develop coping strategies that align with their natural predispositions.
2. Jung's Approach : Focuses on whether an athlete is more introverted or extraverted, guiding personalized approaches to stress management—introverts might prefer quiet reflection, while extraverts might benefit from group discussions.
3. Big Five Approach : Provides a nuanced view of traits like neuroticism (emotional instability) and conscientiousness (discipline), allowing for tailored interventions such as mindfulness or structured planning to mitigate stress.

103. What are some common motivational techniques used in sports, and how can they be applied to overcome periods of low motivation?

Ans :

OD 2014

1. Techniques:
 - i. Visualization: Rehearsing successful performances mentally to boost confidence.
 - ii. Self-Talk: Using affirmations and positive internal dialogue to counter self-doubt.
2. Application : During periods of low motivation, athletes can adopt these techniques by setting aside dedicated time for mental rehearsal and developing personalized mantras that reinforce their commitment and remind them of past successes.

104. Explain the importance of exercise adherence in long-term athletic development. How do benefits of adherence translate into improved performance?

Ans :

DELHI 2016

1. Importance : Consistent adherence to training is essential for building a solid foundation of fitness, refining skills, and reducing injury risk.
2. Benefits Translation : Regular training leads to measurable improvements in strength, endurance, and technique, which cumulatively enhance performance. Consistent practice also builds mental resilience and discipline, which are critical in competitive environments.

105. Define and differentiate between instrumental and hostile aggression in sports. How can these insights help in developing sportsmanship among athletes?

Ans :

OD 2018

1. Instrumental Aggression: A calculated, goal-oriented form of aggression that may be used strategically within the rules.
2. Hostile Aggression: Emotionally charged aggression that often results in unsportsmanlike behavior.
3. Development of Sportsmanship : By understanding these distinctions, coaches can encourage athletes to channel their competitive drive into controlled, strategic actions (instrumental) while teaching emotional regulation techniques to minimize hostile outbursts, thus promoting respect and fair play.

106. Describe how mental imagery, self-talk, and goal setting work together to enhance an athlete's psychological resilience and performance.

Ans :

SQP 2020

Integration of Techniques:

1. Mental Imagery : Allows athletes to visualize success, anticipate challenges, and prepare mentally for competition.
2. Self-Talk : Provides continuous internal reinforcement, transforming negative thoughts into empowering messages.
3. Goal Setting : Creates a structured plan with clear benchmarks, keeping athletes motivated and focused on incremental progress.
4. Enhanced Resilience : When combined, these techniques build a robust mental framework that enables athletes to overcome setbacks, stay committed during challenging training periods, and perform at their best under pressure.

training, adhere to plans, and are reliable team members. Their organized approach is positively correlated with better performance in tasks requiring planning and decision-making.

3. **Extraversion:** An individual high in extraversion is enthusiastic, energetic, talkative, assertive, and enjoys being in the company of others. These athletes often thrive in team sports, demonstrate leadership qualities, and perform well under the pressure of an audience. They seek stimulation and are often very sociable team members.
4. **Agreeableness:** This trait refers to compassionate, good-natured, cooperative, and trusting individuals. In team sports, agreeableness is a major asset, as these athletes are typically helpful, supportive teammates who contribute to a positive and cohesive team environment.
5. **Neuroticism:** This dimension focuses on emotional stability. A person scoring high in neuroticism tends to be nervous, anxious, and excitable, while someone low in neuroticism is calm and composed. High neuroticism can negatively impact sports performance, as anxiety and emotional instability can hinder an athlete's ability to perform under pressure. Conversely, emotionally stable athletes can maintain focus and composure in critical moments.

- 136.** What is exercise adherence and why is it important? Discuss in detail at least four distinct benefits of regular exercise covering physical, mental, and social aspects.

Ans :

DELHI 2003

Exercise adherence refers to the extent to which an individual maintains active and voluntary involvement in a physical exercise program over a prolonged period. It represents the “stickability” or commitment to continue with a regular exercise routine after the initial adoption phase. It is important because the health benefits of exercise are only realized through consistent and long-term participation. Regular exercise offers numerous distinct benefits covering physical, mental, and social well-being:

1. **Health and Physical Benefits:** Consistent physical activity significantly reduces the risk of major lifestyle diseases. It strengthens the heart, improves blood circulation, and helps lower the risk of cardiovascular diseases

like high cholesterol and coronary artery disease. Regular exercise also helps in weight management by burning calories, and it strengthens bones and muscles, which can slow the loss of bone density that comes with age.

2. **Mental Health and Stress Relief:** Exercise is a powerful tool for improving mental health. It is proven to decrease rates of depression and anxiety. During physical activity, the body increases the production of endorphins, which are chemicals that help produce positive feelings and improve mood, making an individual feel more relaxed and happy. This makes exercise an effective therapy for managing the effects of a stressful modern lifestyle.
3. **Cognitive Benefits:** Regular exercise has a direct positive impact on brain function. It increases heart rate, which promotes the flow of blood and oxygen to the brain, and can stimulate the growth of brain cells. This leads to improvements in cognitive functions such as attention control, concentration, and the speed of information processing. For all age groups, physical activity has been shown to protect memory and thinking skills.
4. **Social Cohesion:** Participating in group exercise programs or team sports provides valuable opportunities for social interaction. This helps prevent feelings of boredom and social isolation by connecting people with their community as teammates, opponents, or spectators. The group cohesion and friendships developed through these activities are a major reason why many people adhere to exercise programs.

- 137.** Define aggression in the context of sports, using Gill's four-part criterion. Differentiate clearly between hostile aggression, instrumental aggression, and assertive behavior, providing a specific sporting example for each to illustrate the differences.

Ans :

SQP 2012

In sports psychology, aggression is generally defined as any behavior that is intended to harm or injure another living being who is actively trying to avoid such treatment. Sport psychologist Gill (2000) provided a clear four-part criterion to identify an action as aggressive: 1) it must be a physical or verbal behavior, 2) it must involve causing harm or injury, 3) it must be directed

toward another living thing, and 4) there must be an intention to cause harm.

The key differences between hostile aggression, instrumental aggression, and assertive behavior lie in the intent and goal of the action.

1. **Hostile Aggression :** This is a violent and angry behavior where the primary goal is to harm another person. It is often an impulsive and unplanned reaction to a perceived threat or insult, fueled by intense emotion.
Sporting Example : A soccer player, frustrated after being fouled, gets up and punches the opponent. The intent and goal are purely to inflict injury out of anger.
2. **Instrumental Aggression :** This is a calculated, harmful behavior that is used as a means or an “instrument” to achieve a non-aggressive goal, such as winning. While there is still an intent to harm, the action is not driven by anger but by a desire for competitive advantage.
Sporting Example: A hockey player deliberately body-checks an opponent with excessive force, intending to injure them and remove them from the game, thereby increasing their own team’s chance of winning.
3. **Assertive Behavior:** This is a positive form of expression and is distinct from aggression. Assertive behavior involves playing with maximum effort and energy within the legitimate rules of the sport, without any intention to harm the opponent. It is about standing up for oneself and playing hard but fairly.
Sporting Example: A basketball player making a strong, clean tackle to get the ball from an opponent, using their body legitimately without intending to cause injury.

138. Explain the concept of Goal Setting as a psychological attribute in sports. Describe the three main types of goals (outcome, performance, process) and explain the importance of using the SMART principle to create effective goals.

Ans :

COMP 2006

Goal setting is a mental training technique used to increase an individual’s commitment towards achieving a specific standard of proficiency on a task within a specified time. It is a highly effective method for enhancing performance because it focuses an athlete’s attention, increases their effort and intensity, encourages persistence, and promotes the development of new strategies.

Athletes typically focus on three main types of goals:

1. **Outcome Goals:** These goals focus on the final result of a sporting event, such as winning a championship or finishing in the top three. While they are highly motivating, they are often uncontrollable as they depend on the performance of others.
2. **Performance Goals:** These focus on an athlete’s own achievements, independent of competitors, such as achieving a personal best time or improving shooting accuracy. These goals are more flexible and controllable, allowing athletes to track their progress.
3. **Process Goals:** These goals focus on the specific behaviors and techniques an athlete must execute to perform well, such as focusing on arm position while shooting a basketball or maintaining a certain cadence while running. To make goal setting effective, the SMART principle is used. This ensures goals are:
 - i. **S Specific:** The goal is clear and focuses exactly on what needs to be achieved.
 - ii. **M Measurable:** The goal is quantifiable, so progress can be accurately tracked.
 - iii. **A Action-Oriented:** The goal has clear action steps detailing what needs to be done.
 - iv. **R Realistic:** The goal is challenging yet attainable, so it remains motivating without being discouraging.
 - v. **T Timely:** The goal has a specific timeline or deadline associated with it.

Using SMART goals helps athletes stay focused and energized, and provides a clear path toward achieving their larger objectives.

- 139.** (a) Define motivation and distinguish between intrinsic and extrinsic motivation in sports.
- (b) Describe in detail two different approaches or strategies for motivating athletes, such as the Pedagogical Approach and the Facilitation Approach, giving specific examples of techniques for each.

Ans :

DELHI 2011

- (a) Motivation, derived from the Latin word ‘movere’ (to move), is the driving force that initiates, guides, and maintains behavior over time. In sports, it is the direction and intensity of an athlete’s effort. The two types of motivation are:

- i. **Intrinsic Motivation:** This is an internal drive that comes from within an individual. An athlete is intrinsically motivated when they pursue an action purely for the fun, pleasure, sense of challenge, or personal satisfaction it provides, such as a runner who enjoys the feeling of being outdoors and pushing their limits.
 - ii. **Extrinsic Motivation:** This drive is influenced by external forces or factors. An athlete is extrinsically motivated when they perform an action to earn a tangible reward like prize money or a trophy, or to gain praise and recognition from others.
- (b) Coaches and psychologists use various approaches to motivate athletes.
- i. **Pedagogical Approach:** This approach focuses on using teaching and coaching methods to guide and maintain an athlete's desired behavior. It emphasizes positive relationships and enjoyable training. A key technique is the Guided Discovery Method, where athletes are encouraged to find solutions to problems themselves rather than just being given instructions. This promotes independence and intrinsic motivation. Another technique is providing Valuable Feedback, which gives athletes specific direction and shows them that their efforts are being recognized, thus fueling their drive.
 - ii. **Facilitation Approach:** This approach uses external factors to support and enhance motivation, especially when intrinsic drive is low. A primary technique is the use of Incentives and Rewards, such as medals, prize money, or special recognition, which can effectively motivate athletes to pursue their goals with consistency. Another technique is ensuring the Valance of the Reward, which means understanding what an athlete truly values. For one athlete, being named team captain might be a more powerful motivator (have a higher 'valance') than a pay increase.

- 140.** (a) Explain the psychological skills of Mental Imagery and Self-Talk.
- (b) Describe how an athlete can use each of these skills to enhance their performance, build confidence, and control their thoughts and feelings during training and competition.

Ans :

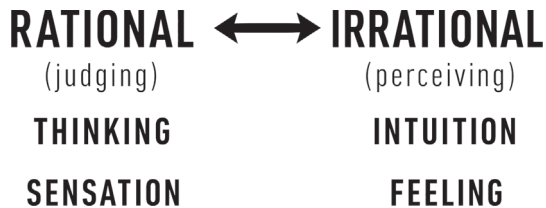
OD 2014

- (a) Mental Imagery and Self-Talk are two powerful psychological skills used by athletes to improve performance.
- i. **Mental Imagery** is the process of using one's senses to create or recreate an experience or visual image in the mind. This mental rehearsal of skills or situations can be so vivid that the nervous system and muscles react in a similar way as if the action were actually being performed.
 - ii. **Self-Talk** is the overt or covert personal dialogue an athlete has with themselves, where they interpret feelings, give instructions, and provide reinforcement. It is an effective technique for controlling thoughts and influencing emotions, which in turn impacts performance.
- (b) Athletes use these skills in various ways to gain a competitive edge.
- i. **Using Mental Imagery:** An athlete can use mental imagery to enhance performance by mentally rehearsing a perfect technique, such as a flawless gymnastic routine or a perfect golf swing. This helps to solidify motor patterns. To build confidence, an athlete can imagine themselves successfully performing in a difficult competitive situation, which desensitizes them to anxiety and reinforces a belief in their own ability. It also allows them to control feelings by mentally preparing for stressors and visualizing a calm, focused state.
 - ii. **Using Self-Talk:** An athlete can use self-talk to enhance performance by using brief, task-specific cue words like "explode" for a sprinter or "turn" for a tennis player to reinforce correct technique at the right moment. They can build confidence and self-efficacy by using encouraging phrases like "You can do it" or "Stay strong" during difficult moments. To control thoughts and feelings, an athlete can use mood words like "hard" or "blast" to increase arousal or use instructional phrases to maintain focus and block out distractions when they get tired or their mind wanders.

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CASE BASED QUESTION

141. In reference to the picture answer the following questions :



- (i) According to Jung, Thinking and Sensation are typically described as:
- Rational (Judging) functions
 - Irrational (Perceiving) functions
 - Emotional functions
 - Social functions

Ans :

- (a) Rational (Judging) functions
- (ii) Which of the following pairs represents Jung's Irrational (Perceiving) functions?
- Thinking and Feeling
 - Sensation and Intuition
 - Intuition and Feeling
 - Feeling and Sensation

Ans :

- (c) Intuition and Feeling
- (iii) A person who prefers Sensation tends to focus on:
- Abstract possibilities and patterns
 - Objective facts, tangible data, and concrete details
 - Harmonizing values and empathy
 - Logic and theoretical constructs

Ans :

- (b) Objective facts, tangible data, and concrete details
- (iv) Intuition, as a function, is primarily concerned with:
- Immediate sensory experiences
 - Logical reasoning and analysis
 - Underlying meanings, patterns, and future possibilities
 - Strict adherence to facts and data

Ans :

- (c) Underlying meanings, patterns, and future possibilities

142. In reference to the picture answer the following questions :



- (i) Which of the following traits in the Big Five Personality Model is associated with imagination, creativity, and a preference for new experiences?
- Openness
 - Conscientiousness
 - Extraversion
 - Neuroticism

Ans :

- (a) Openness
- (ii) A person who is highly disciplined, goal-oriented, and prefers structure in their work exhibits a high level of which personality trait?
- Agreeableness
 - Conscientiousness
 - Openness
 - Extraversion

Ans :

- (b) Conscientiousness
- (iii) Which of the following traits in the Big Five Model describes someone who is talkative, energetic, and enjoys social interactions?
- Neuroticism
 - Agreeableness
 - Extraversion
 - Openness

Ans :

- (c) Extraversion

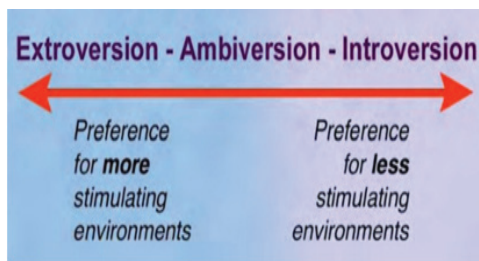
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- (iv) A person who often experiences stress, anxiety, and emotional instability is likely to score high on which of the following personality traits?
- Agreeableness
 - Openness
 - Neuroticism
 - Conscientiousness

Ans :

- (c) Neuroticism

143. In reference to the picture answer the following questions :



- (i) The Big Five model of personality is commonly known by the acronym:
- OCEAN
 - SMART
 - GROW
 - PLAN

Ans :

- (a) OCEAN
- (ii) Which dimension of the Big Five relates to social interaction, enthusiasm, and outgoingness?
- Openness
 - Extraversion
 - Conscientiousness
 - Agreeableness

Ans :

- (b) Extraversion
- (iii) An individual who is creative, curious, and open to new experiences typically scores high on:
- Neuroticism
 - Conscientiousness
 - Openness
 - Agreeableness

Ans :

- (c) Openness

- (iv) A person who is organized, reliable, and goal-oriented is most likely high in:
- Extraversion
 - Conscientiousness
 - Neuroticism
 - Agreeableness

Ans :

- (b) Conscientiousness

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